



SUSTAINABILITY REPORT
2018



Sogin Group - Sustainability Report 2018
Approved by Sogin's BoD on 25 June 2019

SO.G.I.N. S.p.A. – Company limited by shares for the management of nuclear power plants
Registered Office: via Marsala no. 51 C, 00185 Rome
Rome Company Registry – tax and VAT number 05779721009
R.E.A. 922437 – Court of Rome no. 130223/99
Single shareholder Company – Fully paid-up share capital EUR 15,100,000

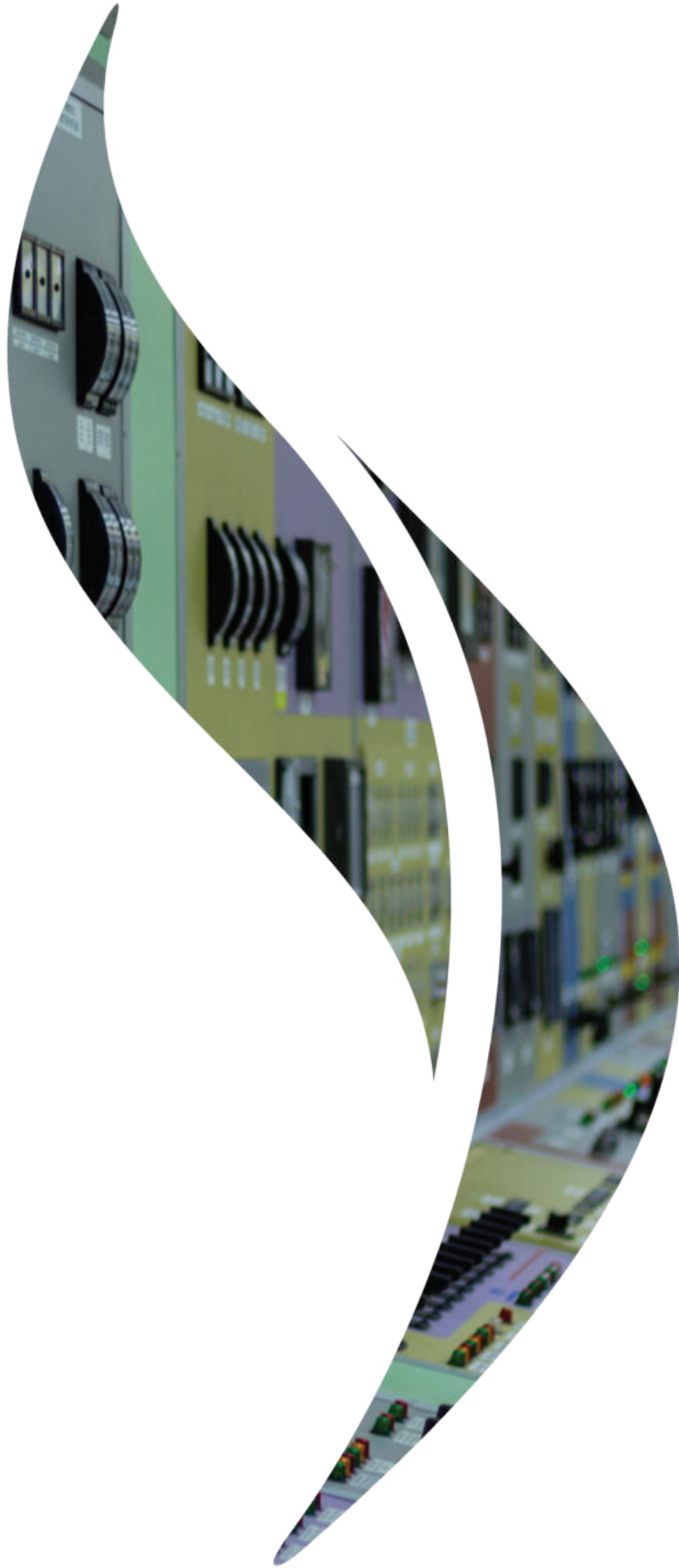


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LETTER TO STAKEHOLDERS

Dear Stakeholder,

Dear Stakeholder,

Again, this year, we want to renew the agreement between Sogin Group and its stakeholders with the publication of the Sustainability Report.

This was an important year for us, which aimed at including the major themes of sustainability within the wider scenario of business culture, by combining the ongoing dialogue with stakeholders, the environmental protection and the security of citizens, with the activities carried out by Sogin Group, namely decommissioning operations and management of radioactive waste.

In 2018, we focused on three main aspects: accelerating decommissioning operations and reducing structural costs; developing and consolidating international relationships; promoting our know-how and unique expertise. At the end of this year, thanks to the efforts and professional skills of the women and men working for the Group, we have achieved the best results in terms of decommissioning operations (over 80 million Euro). In Garigliano power plant, we have opened the reactor's containment biological screen, to start its decommissioning. In Latina power plant, we have completed the cold testing on LECO plant that will be used for the extraction and conditioning of radioactive waste. In Bosco Marengo, decommissioning operations were successfully concluded. In Casaccia plant, we have obtained the authorisation for the operation of the OPEC 2 interim storage facility. In Caorso power plant, resins were shipped to Slovakia, where the cold tests for incineration have been concluded. In Rotondella plant, we have completed the site preparation for the monolith cutting operations, which will be implemented in the first half of 2019.

With the 2018 Budget Law, Sogin was appointed by the Italian Government for the decommissioning of the Ispra-1 reactor located in the Ispra Joint Research Centre of the European Commission (Varese), thus, reaffirming the confidence in the Group.

The operations carried out in 2018 combined with our experience in the decommissioning and radioactive waste management fields, have strengthened our presence in the national and international market for a total of EUR 14.2 million of contracts, the second- best result after 2017 (EUR 20 million).

In 2018, Sogin continued its collaboration with the IAEA (International Atomic Energy Agency), with a Technical Review on two strategic and complex projects – the safe dismantling of the nuclear power reactors (vessels and internals) of Trino and Garigliano nuclear power plants. The collaboration was originally launched in 2017 with the first International Peer Review of the Sogin Decommissioning and Radioactive Waste Management Programme in Italy. This collaboration has, again, confirmed the expertise of the Group in carrying out nuclear dismantling and decommissioning activities.

In 2018, we have presented our circular economy model to our stakeholders; this model is based on three main drivers: reusing structures, systems and components; recycling materials; and reducing the environmental impact.

The implementation of this model in our projects and dismantling operations, combined with the IAEA evaluation, will allow us – when closing the nuclear fuel cycle – to recycle 89% of the waste resulted from decommissioning.

To this end, in November 2018, within the framework of the European Week for Waste Reduction, we held a meeting in Garigliano nuclear power plant with our stakeholders, to introduce the adopted circular economy policies; on that occasion, we also attended the transport of 400 tonnes of materials of the turbine rotor- alternator sent for recycling. In addition to focusing our attention on the external stakeholders, in 2018, we devoted our energy and commitment to the internal ones, by listening to their opinions and by mapping sustainability priorities, through professional development projects, specific training programmes and talent development courses.

Marco Enrico Ricotti
Chairman



Luca Desiata
Chief Executive Officer



METHODOLOGICAL NOTE

The Sustainability Report is a useful instrument to shed a light on the economic, social and environmental activities, as well as on achieved results and future perspectives of Sogin Group.

This document refers to 2018 financial year (01/01/2018 – 31/12/2018) and it was approved by Sogin Board of Directors on 25 June 2019.

Each year Sogin Group publishes its Sustainability Report in view of the high technological, economic, industrial and socio- environmental value of the operations that it carries out to ensure the safety of local citizens and communities, the protection of the environment and future generations.

The data and information contained in the Report are compared, where possible, to those of the two previous financial years.

The 2018 reporting scope of Sogin Group Sustainability Report includes:

- Sogin (Parent Company) in charge of the safe maintenance and dismantling of Italian nuclear power plants and of radioactive waste management;
- Nucleco (of which Sogin holds 60% of its share capital), in charge of the treatment and interim storage of radioactive waste and sources resulting from medical and hospital activities and scientific and technological research activities.

The Sustainability Report is an official source of information of Sogin Group, it is intended for all its stakeholders and it includes data on the Company economic, industrial, social and environmental performance. The report was prepared to provide reliable, complete, balanced, accurate, understandable and comparable information, as required by the adopted reporting standards: Sustainability Reporting Standards provided by the Global Reporting Initiative (GRI), under the option “in accordance-core”.

Moreover, the document also complies with the principles of inclusiveness, impact, materiality and compliance provided for in the AA1000 AccountAbility standard.¹

The figures provided in the Report were accurately calculated according to the results of the financial accounts and other information systems used by Sogin Group; in case of estimates for the definition of indicators, the modality applied for their quantification is indicated.

In case of figures related to the Group single companies, reference is respectively made to “Sogin” and “Nucleco”. Vice-versa, information concerning both companies and consolidated data are collected under the term “Sogin Group”.

No limitations and changes can relevantly affect the comparability among periods.

¹ AccountAbility Principles 2018 (AA1000AP - 2018), issued by AccountAbility, Institute of Social and Ethical AccountAbility.



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ISOGIN GROUP

ABOUT US

Sogin is the State-owned company responsible for the Italian nuclear power plants decommissioning and radioactive waste management, including that produced by industrial, research and nuclear medicine activities. All the stages of these activities, from the design stage to the implementation stage, aim at closing the entire Italian nuclear power cycle, while guaranteeing citizens' safety, safeguarding the environment and protecting future generations.

Entirely owned by the Italian Ministry of Economy and Finance, Sogin has been operating since 2001, following the strategic guidelines of the Italian Government.

In addition to the four Italian nuclear power plants of Trino (Vercelli), Caorso (PC), Latina and Garigliano (CE), Sogin manages the decommissioning of the former fuel cycle research facilities: FN of Bosco Marengo (AL), EUREX of Saluggia (VC), OPEC and IPU of Casaccia (RM) and ITREC of Rotondella (MT).

With the 2018 Italian Budget Law, Sogin was appointed for the decommissioning of the Ispra-1 reactor, located in the Joint Research Centre (JRC) complex of Ispra (Varese).

The Company has also the task of siting, designing, building and operating the National Repository, an environmental surface facility for the safe long-term storage and disposal of all radioactive waste. On the same site of the National Repository, a Technology Park will be created that includes: a research centre, open to international cooperation, in the fields of nuclear decommissioning and radioactive waste management.

All the activities performed by the Company are systematically checked by competent institutions and bodies, both national and local, in compliance with the UN International Atomic Energy Agency (IAEA) Guidelines and the national legislation, one of the most stringent in Europe. These systematic checks are carried out after specific authorisation procedures, based on nuclear safety, radioprotection and environmental compatibility criteria. These activities are financed by a component of the electricity tariff.

Moreover, Sogin also coordinates the activities envisaged by the agreement ratified between the Italian Government and the Russian Federation under the Global Partnership programme. In particular, the agreement concerns the dismantling of Russian nuclear submarines and the management of radioactive waste and irradiated fuel.

In addition to this important intergovernmental collaboration, Sogin has always been committed internationally, with two foreign offices in Moscow and Bratislava, in three areas:

- Development of relationships and collaborations with international bodies and foreign, public and private, operators, to foster the exchange of applicable know-how in the decommissioning of Italian nuclear plants;
- Commercial development with the acquisition of projects, studies, consultancies and technical services on the dismantling of the plants, the management of radioactive waste, as well as on safety and radiological protection;
- Support to Italian institutions to comply with the provisions of international treaties and commitments.

In 2004, Sogin becomes a Group by acquiring 60% of Nucleco, the company engaged in the integrated management of waste and radioactive sources, in the decommissioning of nuclear installations and in the decontamination of industrial sites. For the remaining 40% of share capital, Nucleco belongs to ENEA, the National Agency for new technologies, energy and sustainable economic development.

Great part of the activities performed by Nucleco is included in the decommissioning programme of nuclear power plants and fuel cycle facilities developed by Sogin, especially remediation, treatment activities and radioactive waste repackaging activities. Within the scope of the Integrated Service, managed by ENEA, engaged in centralising the management of radioactive waste produced in Italy, Nucleco manages the collection, treatment and disposal of radioactive materials, orphan and non-orphan sources, resulting from medical, industrial and research sectors. Nucleco is also engaged in the ordinary and extraordinary management of ENEA laboratories and in managing the radioactive waste of TRIGA and TAPIRO plants in Casaccia site.

Sogin Group is the most representative Italian institution in the field of nuclear decommissioning and radioactive waste management. These objectives are carried out through a circular economy strategy aimed at reducing the environmental impact generated by the presence of nuclear sites.

Committed in siting, designing, building and operating the National Repository, Sogin promotes a sustainable development model which, in addition to freeing the current facilities and areas from radiological constraints, will also stimulate an economic, social and environmental development in the area that will host the new infrastructure.

SOGIN GROUP MISSION

Protecting the present

- Carrying out the decommissioning and the safe maintenance of Italian nuclear power plants, to restore the “green field”, a condition free of radiological restrictions, and return the site to the community for its reuse.
- Managing the radioactive waste generated by electricity production, nuclear power plants decommissioning operations, industrial activities and nuclear medicine and scientific and technological research activities.

Ensuring the future

- Closing the Italian nuclear power cycle by siting, designing building and operating the National Repository and Technological Park for the long-term safe storage of radioactive waste.
- Reducing the environmental impact of decommissioning activities by minimising the amount of radioactive waste and by implementing production procedures that allow the recycling and reuse of recyclable materials.



GOVERNANCE

Sogin Group governance system includes the Shareholders' Meeting, the Board of Directors, the Chairman, the Deputy Chairman, the Chief Executive Officer, the Board of Statutory Auditors. Information on the main Sogin governance bodies and its subsidiary company Nucleco are reported below. For further details please refer to the websites sogin.it and nucleco.it.



SOGIN AND NUCLECO SHAREHOLDERS' MEETING

Sogin Shareholders' Meeting is composed of the Ministry of Economy and Finance, the single shareholder of the whole share capital.

Nucleco Shareholders' Meeting is composed of Sogin, which holds 60% of its share capital and of ENEA, which holds the remaining 40%.

Both Meetings are chaired by the Chairman of the Board of

Directors, and, where the latter is absent or indisposed, by the Deputy Chairman.

The Meeting is also responsible of approving the Financial Statements, appointing the members of the Board of Directors and the Board of Statutory Auditors, defining their salaries, appointing the statutory audit company and its consideration.



SOGIN BOARD OF DIRECTORS

The Board of Directors (BoD) consists of five members, appointed by the ordinary Shareholders' Meeting and elected according to the applicable law on gender balance.

The Directors have been appointed on 20 July 2016, for the 2016-2018 financial years, and will remain in office until the approval of 2018 Financial Statements.

The BoD is responsible for the definition of corporate and Group strategies, and guidelines of the internal control system, it approves the Draft Budget, updates the Organisation, Management and Control Model and, acting on a proposal of the person in charge of Corruption Prevention and Transparency, it updates the Three-year Programme against Corruption. Moreover, it appoints the members of the Supervisory Body and defines their salaries, it appoints the Manager in charge of drawing up the corporate accounting documents and the Manager for the Prevention of Corruption and Transparency.

The Chairman of the Board of Directors is the Company's representative and has signatory powers, he chairs the Shareholders' Meeting, convenes and chairs the Board of Directors, establishes its agenda and verifies the implementation of the resolutions.

The Chairman in office, with the approval of the Shareholders' Meeting, has been given powers in matters of external and institutional relations and internal control, which he periodically reports to the Board of Directors and the Board of Statutory Auditors each three months. The remuneration of the Chairman, according to his powers, has been defined by the Board of Directors, with the approval of the Board of Statutory Auditors, in compliance with the regulations of the

remuneration system for the members of the administration of unlisted public companies.

As stated in the Company's articles of association, the Board of Directors can appoint a Deputy Chairman, of the Shareholders' Meeting has not done so, to replace the Chairman in case of absence or impediment, without additional compensation.

The office of Deputy Chairman is held by the Chief Executive Officer (CEO).

The Board of Directors has entrusted the Chief Executive Officer in office with all the powers for the management of the Company, except for:

- the powers reserved, by law or by the company's articles of association, to the Chairman and the Board of Directors;
- the powers conferred to the Chairman, as well as those that the Board of Directors has not expressly reserved.

The Chief Executive Officer periodically reports – each three months – to the Board of Directors and to the Board of Statutory Auditors on the performance of such duties and powers.

2016-2018 Sogin BoD Members

Chairman	Marco Enrico RICOTTI
Deputy Chairman and CEO	Luca DESIATA
Non-Executive Directors	Patrizia Leonarda FELETIG Fabiana MASSA Alessandro PORTINARO



NUCLECO BOARD OF DIRECTORS

The Board of Directors (BoD) consists of three members, appointed by the Shareholders' Meeting on 11 May 2018 for the 2018-2020 financial years at the end of the investigation launched by Sogin to identify the new members according to the order issued on 16 March 2017 by the Ministry of Economy and Finance.

The Chairman of the Board of Directors is the company's representative and has signatory power, he chairs the Shareholders' Meeting, convenes and chairs the Board of Directors, establishes its agenda and verifies the implementation of the resolutions.

Upon the approval of the Shareholders' meeting, the BoD has conferred full powers for the management of the Company to the Chief Executive Officer (CEO) in office, except for

those solely conferred to the Chairman and to the Board of Directors. The BoD has also appointed the Chief Executive Officer (CEO) as Deputy Chairman of the Company, to replace the Chairman when the latter is absent or prevented from performing his office according to the legislation and to the company's articles of association, without additional compensation.

2018-2020 Nucleco BoD Members

Chairman	Alessandro DODARO
Deputy Chairman and CEO	Lamberto D'ANDREA
Non-Executive Director	Fernanda DI GASBARRO



SOGIN BOARD OF STATUTORY AUDITORS

The Board of Statutory Auditors is the Supervisory body which monitors the Company's compliance with laws, with the articles of association, the principles of correct administration, the suitability of the Company in terms of organisation, administrative accounting system and its correct functioning.

The Board of Statutory Auditors, as under the law and the articles of association, consists of three Statutory Auditors and two Substitutes, appointed by the ordinary Shareholders' Meeting on 14 July 2017, according to the applicable law on gender balance. Their office will end upon the approval of 2019 Financial Statements.

2017-2019 Sogin Board of Statutory Auditors Members

Chairman	Luigi LA ROSA In charge from 9 August 2018
Statutory Auditors	Angela Daniela IANNI Salvatore LENTINI Statutory Auditor from 9 August 2018
Substitute Auditors	Luisa FOTI Maurizio ACCARINO



NUCLECO BOARD OF STATUTORY AUDITORS

The Board of Statutory Auditors is the Supervisory body which monitors the Company's compliance with laws, with the articles of association, the principles of correct administration, the suitability of the Company in terms of organisation, administrative accounting system and its correct functioning.

The Board of Statutory Auditors, as under the law and the articles of association, consists of three Statutory Auditors and two Substitutes, appointed by the Shareholders' Meeting on 23 May 2017, according to the applicable law on gender balance, and the same procedure adopted by the BoD as stated in the order issued on 16 March 2017 by the Ministry of Economy and Finance.

The Chairman of the Board of Statutory Auditors and a Substitute Auditor are appointed by Sogin Shareholders while two Statutory Auditors and a Substitute Auditor are appointed by ENEA's Shareholders. Their office will end upon approval of 2019 Financial Statements.²

2017-2019 Nucleco Board of Statutory Auditors Members

Chairman	Cesare CARASSAI
Statutory Auditors	Valentina VACCARO Roberto IASCHI
Substitute Auditors	Marcellino DATOADDIO Lorena SERAFINELLI

² The approach applied so far for the appointment of the Board of Statutory Auditors provides for Sogin to identify the Chairman and one Substitute Auditor, while ENEA appoints two Statutory Auditors and a Substitute Auditor.



COMPANY APPOINTED FOR THE STATUTORY AUDIT OF SOGIN GROUP

The Company in charge for performing the Statutory Audit of Sogin Group for 2017-2019 financial years is PRICEWATERHOUSECOOPERS S.p.A. The office was conferred by the Shareholders' Meeting of Sogin and Nucleco, following

a European procurement procedure and on a reasoned proposal by the Boards of Statutory Auditors of Sogin and Nucleco.



OFFICER OF THE COURT OF AUDITORS APPOINTED FOR MONITORING SOGIN FINANCIAL MANAGEMENT

As a wholly owned subsidiary of the Ministry of Economy and Finance, Sogin is directly monitored by the Court of Auditors. Until March 2018, the functions of monitoring officer have been appointed to the Director Giuseppe Maria Mezzapesa. In April 2018, the Presidency Council of the Court of Auditors has appointed this office to the Judge Rossana De Corato. Until September 2018, the monitoring functions of Deputy Officer have been appointed to the Director Chiara Bersani.³

The monitoring Officer, or the Deputy Officer, is entitled to attend the meetings of the Shareholders, Board of Directors, Board of Statutory Auditors, as well as the meetings of the Supervisory Body. As a rapporteur, the Officer prepares the Report for the Court, which, in turn, approves it according to the foreground and reports the outcomes of the Company's financial management to the Presidents of the two Chambers of the Parliament.



SOGIN SUPERVISORY BODY

The Supervisory Body monitors the functioning, effectiveness and compliance of the Organisational, Management and Control Model, and updates it when needed. In compliance with the standards of professionalism, honourability, functional autonomy and independence, the body consists of three members: two external members, one of which is appointed as Chairman, and one internal member. The Supervisory Body shall hold office for a period defined by the Board of Directors upon appointment, and, in the absence of a specific definition, it shall hold office for the duration of the mandate of the Board of Directors under which it was appointed, and it will perform its functions and duties, for an extended period, until the renewal of the Supervisory Body. The members of the Supervisory Body have been appointed on 7 October 2016; according to the provisions in force in 2016⁴ issued by the Ministry of Economy and Finance and ANAC, the Board of Directors has appointed, as internal

member, a person in charge for Corruption Prevention and Transparency. In 2018, the Supervisory Body has held seven meetings.

2016-2019 Sogin Supervisory Body Members

Chairman	Francesco SANTANGELO
External Member	Alessia FULGERI
Internal Member	Mariano SCOCCO (Manager of the Legal, Corporate and Compliance Department, and in charge for Sogin's Corruption Prevention and Transparency)



PREVENTION OF CORRUPTION AND TRANSPARENCY IN SOGIN GROUP

On 31 January 2018, on a proposal of the Manager of Corruption Prevention and Transparency (below MCPT), the Board of Directors has adopted a Three-Year Plan for the Prevention of Corruption (below TPPC) for 2018-2020 financial years.

In the same meeting, the BoD has also adopted the document on the "Irregularity and Crime Management System and

Protection of the Reporting Employee, under art. 54-bis of the Legislative Decree nr. 165/2001".

Due to the new anti-corruption and transparency regulations introduced in 2018, two documents have been prepared that are intended for Senior Managers and the Members of the Supervisory Body and another for the first-level managers of the Company and the Managers of operational units.

³ In February 2019, the Presidency Council of the Court of Auditors has appointed the Judge Maria Gabriella Dodaro Deputy Officer.

⁴ The National Anti-Corruption Authority (ANAC), with resolution no. 1134/2017 has reviewed the conclusions drawn upon the adoption of resolution no. 8/2015, deeming necessary to exclude the Manager of Corruption Prevention and Transparency from the Supervisory Body. To avoid affecting the organisational structure set out according to the previous resolution, ANAC has ruled that the Companies with appointed Managers in their Supervisory Bodies, can hold them until the end of their offices.

On 11 April 2018, the BoD has identified the Supervisory Body as responsible for the same functions of the Independent Assessment Body.

Upon the application of the FOIA, an act that accurately regulates the innovations introduced under the Legislative Decree No. 97/2016, eight requests have been sent to the website sogin.it to access the information of the Company (of which seven general requests and one simple request), three of which (general requests) were received in 2018.

All the requests have been fulfilled by the deadline stated under the Legislative Decree no. 33/2013.

To promote the irregularity reporting and protect the reporting employee, the BoD has prepared and approved a document on whistleblowing and on the protection of the whistleblower's identity.

In 2018, Nucleco has also drafted the 2018-2020 Three-Year Plan for the Prevention of Corruption, adopted by the BoD on 31 May 2018. No requests of information access have been received so far.



SOGIN DATA PROTECTION OFFICER

On 25 May 2018, Sogin Internal Audit Director was appointed Data Protection Officer (DPO). This office complies with

the EU Regulation No. 2016/679 (General Data Protection Regulation, GDPR), about the protection of personal data.



SOGIN AND NUCLECO ORGANISATION, MANAGEMENT AND CONTROL MODEL AND ETHICAL CODE

Sogin and Nucleco are provided with an Organisation, Management and Control Model (OMCM) to prevent and tackle the perpetration of predicate offences of administrative liability (under Legislative Decree No. 231/2001) and the phenomena of corruption and maladministration under law No. 190/2012. An integral part of this Model consists of the Ethical Code.

The latter is a Charter of Principles to direct and rule the organisational and individual behaviours to be complied with on behalf of those who share the company's mission and have an interest in pursuing it.

The two documents consist of recommendations of the Board of Directors. The task of monitoring the functioning, effectiveness and compliance with the OMCM, as well as the update of the latter, are appointed to the Supervisory Body. Anyone becoming aware of possible anomalies and/or behaviours in breach of the Organisation, Management and Control Model and the Ethical Code is required to report them to the Supervisory Body, in written and anonymously, by defining facts and events in a detailed way.

Update of Sogin OMCM

The general section of the OMCM and the Ethical Code sets out the principles and rules that Sogin has identified as necessary requirements to develop and hold institutional, contractual or non-contractual relationships with the Company.

In 2018, the Board of Directors continued its activities to strengthen the effectiveness of the OMCM, updated on 19 July 2017 in its general section and in the Ethical Code.

On 29 May 2018, the Board of Directors approved the amendments introduced in the general section of the OMCM and the document on the "Management of Reports to the Supervisory Board and the Protection of the Whistleblower" by adopting the provisions stated under art. 1 and art. 2 of Law No. 179/2017.

Moreover, on 18 December 2018, the BoD updated the Special Sections of the OMCM to introduce, in its internal regulations,

the predicate offences of administrative liability of legal persons Legislative Decree No. 231/2001, as incorporated in the legal system after 2013.

In addition to this, during 2018, further activities were implemented to draft the Special Section of the OMCM to be applied in Sogin offices in Slovakia for the liability of legal persons. According to Law No. 91/2016 of the Slovakian Republic, and similarly to the Italian Legislative Decree No. 231/2001, an autonomous liability is introduced for legal persons, which is added to the criminal liability of the individual, physical person, and physical offender and, in paragraph 2, it extends this liability to organisational units registered in the territory of the Slovakian Republic.

For further details, please refer to the full version of the OMCM and the Ethical Code available on sogin.it.



SOGIN INTERNAL CONTROL SYSTEM

The Internal Control System is a set of rules, procedures and organisational structures that, through an appropriate system of identification, measurement and risk monitoring, allows to attain the following objectives:

- Efficiency and effectiveness of corporate processes;
- Protection of the value of the assets;
- Reliability and integrity of accounting and management information;
- Legal compliance with internal procedures.

As defined under the articles of association and the Organisation, Management and Control Model, the Internal Control System involves:

- The Board of Directors;
- The Chairman of the Board of Directors;
- The Internal Control function;
- The Person in charge for the Internal Audit;
- The second-level monitoring functions;
- The Operating Structures;
- The Executive in charge;
- The Board of Internal Auditors;
- The Supervisory Body;
- The Company in charge for the Statutory Audit;
- The Manager of Prevention of Corruption and Transparency.

During 2018, the Data Protection Officer was included in the Internal Control System to execute the UE Regulation No. 2016/679 (GDPR).

The Internal Control System includes line checks, second-level checks and independent checks. Such operations are regularly performed within the corporate processes by those who carry out a specific activity and by those who are responsible for its supervision.

Second-level checks are regularly carried out by the functions of risk management, compliance, assessment of the integrated quality, security and environmental management system, management control and by the Executive in charge, according to their specific competencies.

Finally, independent checks are carried out by the Internal Audit function which directly reports to the Senior Management on the design and overall functioning of the system.

According to the Audit Plan - approved by the BoD on 11 April 2018 - a total of 4 Audits and 5 Follow-ups have been carried out. The verification activities have involved, among the rest, business processes related to management of ongoing variations, external communication, direct procurement to external consultants, management of classified and non-classified information and staff management. During 2018, the Supervisory Body has evaluated submitted reports with attention, discretion and confidentiality, and identified the behaviours incompatible with the provisions of the internal control system, OMCM and the Ethical Code.

During 2018, no provisions or punitive actions have been implemented in executing the disciplinary system established in the General Section of the OMCM.



NUCLECO INTERNAL CONTROL SYSTEM

In 2018, Nucleco Internal Control System was appointed to a specific corporate function and to the Supervisory Body. The latter was established under the Legislative Decree No. 231/2001 and consists of three members: two external members and one internal member.

In 2018, audits and other internal control systems have been successfully carried out and completed, thus, highlighting the reliability of the Control System in monitoring the correct

and constant implementation of laws, regulations and internal procedures and in complying with the Organisation, Management and Control Model.

In 2018, no behaviours in breach of the provisions of the internal control system, OMCM and the Ethical Code have been reported to the Supervisory Body. No provisions or punitive actions have been implemented as for Corruption and Transparency.



SOGIN RISK MANAGEMENT SYSTEM

Sogin Risk Management consists of Enterprise Risk Management processes and Project Risk Management Processes, and it aims at defining and implementing a structured process to analyse and manage the main risks and uncertainties to which the Company is exposed.

The Enterprise Risk Management includes first-level sub-processes, activities, controls and the regulations that the Company shall comply with.

To map its business processes, Sogin operates the SAP IT system - Governance, Risk & Compliance to monitor business risks and compliance. In 2017, the assessment of first-level risks and checks were carried out on some business processes.

Risk owners have been called to assess, in terms of probability of occurrence and impact, the different kinds of risk related to each business activity, by considering expected risk, after mitigation, and residual risk.

In 2018, the implementation of the abovementioned methodology was confirmed and extended to further business sectors; the same year has seen the introduction of new Guidelines for the management of business risks, as approved by the Board of Directors in September 2017. Therefore, there was a shift from a merely qualitative approach to a quantitative approach in defining the business risk level, which is now related to materiality thresholds.

SOGIN		
Risk Category	Risk Factor	Structures and Mitigation actions
STRATEGIC RISK		
Risks generated by changes in the institutional, political and industrial frameworks, legislative and regulatory framework or changes in the business ability to take correct decisions and implement them in an appropriate way, especially concerning the achievement of milestones, task drivers and effectiveness objectives set out by the Italian Regulatory Authority for Energy, Networks and Environment (ARERA).	Non-effective implementation of the strategic initiatives of the Company, which might prevent it from achieving defined objectives. This risk applies both to short-term initiatives (budget) and to long-term initiatives (four-year programme), as well as to market operations.	Appropriate organisational structures and specific project teams to develop and monitor business achievements and performance in terms of milestones and task drivers.
REPUTATIONAL RISK		
Risks generated by conditions which may cause serious injury to the Company ability to react to external changes and/or to affect change in the desired direction and to develop solid and long-lasting relationships with stakeholders, based on mutual trust. Among the reputational risks there are: cyber security threats and anomalies.	Gap between Sogin perceived image and Sogin identity, change of external expectations and beliefs, legal non-compliance. Dissemination of information that is not shared with the Senior Management, presence of incorrect information and data which are not in line with the corporate strategy.	Internal and external monitoring of the perceived quality of achieved results, features of the work environment and management quality, performed by the office in charge of External Relations.
ECONOMIC, FINANCIAL AND ASSET RISK		
Risks generated by events that might affect business profits, balance of cash inflows and outflows and/or corporate assets.	Failure, on behalf of ARERA, to recognize the costs reported in final financial statements that may result in possible losses for the Company. Contestation, on behalf of ARERA, of the budget entries and programme, possible deviations between budget and plan, and incorrect allocation of cost items.	Constant analysis and monitoring of budget documents, deviation analysis and verification of the correct allocation of cost items performed by the Financial Administration and Control Function.
COMPLIANCE AND INTEGRITY RISK		
Risks generated by irregular situations, violations of internal or external rules, and/or by illegal or fraudulent behaviours performed by the Company, its employees, collaborators, contractors and/or suppliers which may lead to a misalignment with corporate directives and objectives, or result in judicial or administrative sanctions for the Company.	Breaching mandatory rules (law and regulations) or self-regulation rules. Legal non-compliance may significantly affect corporate operations, economic outcomes and financial balance. Failure to comply with transparency, legality, truthfulness, promptness, and clarity of information standards in complex situations, and failure to consider specific features of the stakeholders, including their roles and specific needs. Irregular behaviours on behalf of internal and external subjects, enhanced by possible weaknesses in the control procedures intended to protect the corporate assets.	Monitoring of the reference legal framework, both specific sector regulations and general regulations, consequent adaptation to applied changes, promotion of a corporate culture based on the principles of honesty, integrity and fairness, as also stated in the Ethical and Behavioural Code and through the implementation of ongoing improvement processes in the internal control system. The reference office is the Legal, Corporate and Compliance Office.

SOGIN		
Risk Category	Risk Factor	Structures and Mitigation actions
OPERATIONAL RISK		
Risks generated by organisational anomalies due to scarce or inappropriate allocations of resources and competencies, dysfunctions in technological and IT corporate systems and procedures, especially concerning the Cyber Threat Model.	<p>Dysfunctions of internal processes, due to negligence in carrying out tasks and to scarce or erroneous communication, which may lead to interruptions in the execution of decommissioning projects or criticalities in safe maintenance and management of maintenance activities.</p> <p>Lack of availability of appropriate human resources to ensure the effectiveness and efficiency of the structure, and thus, the achievement of objectives.</p> <p>Possible loss of competence (know-how) and excessive concentration of competencies, powers and activities divided by few resources.</p> <p>Operation disruptions caused by the inefficiency of the IT infrastructure.</p>	<p>Adoption and updating of operational procedures, planned/ordinary and extraordinary maintenance, provision of specific training courses. Presence of technical monitoring tools, able to control and detect possible anomalies.</p> <p>Periodical implementation of assessment programmes, specific training courses, annual performance evaluation and Segregation of Duty. Disaster Recovery and Data Backup procedures. Specific policies ruling access to information, IT access control systems and prevention from possible external attacks. These operations are ensured by all corporate offices.</p>
REPORTING RISK		
Risks generated by inadequacy and/or anomalies in qualitative and quantitative internal flows, of financial, physical, technical, social and environmental nature, which may cause erroneous representations of the corporate reality or single cases detected in financial statements or in the reports addressed to the internal management; thus, negatively affecting decision-making processes, performance planning and assessment of ARERA and other stakeholders.	Inappropriate identification, processing, transmission and reception of information flows and failure to comply with the implementation times set out for programmed interventions.	Adoption of specific policies on information management and continuous monitoring of the achievement of objectives through competent organisational structures. The activity is in charge of the Regulatory office.



NUCLECO RISK MANAGEMENT SYSTEM

The management and control model under Legislative Decree No. 231/2001 is regularly updated in line with new regulations on administrative liability; the model's functioning is based on an integrated procedure system which controls all corporate activities.

Nucleco has identified the main processes affecting the implementation of the financial reporting, by implementing key checks for risk reduction. A table describing the risk factors of identified categories, related structures and mitigation actions is reported below.

NUCLECO		
Risk Category	Risk Factor	Structures and Mitigation actions
TECHNOLOGICAL AND MARKET RISK		
	Specific nature and age of plants and equipment which have not been recently replaced. Waste treatment processes and progressive reduction of space in storage facilities.	Regular replacement of equipment and instruments. Verifying the possibility to extend the coverage of waste treatment technologies through agreements with other stakeholders, to access existing foreign systems and technologies.
CREDIT RISK		
	Exposure to potential losses resulting from the failure of the parties (mainly Sogin and ENEA shareholders) to comply with their payment obligations.	Although credit risk is a real factor in the general economic crisis, it does not affect the business continuity because: over 80% of due receivables is from Sogin, approx. 10% from ENEA and the residual part (approx. 10%) is due from private clients and Public Institutions.
LIQUIDITY RISK		
	Insufficient financial resources to cover cash-flow requirement.	The risk of liquidity is not relevant since cash flows resulting from corporate management along with the current financial and asset structure enable managing cash commitments without borrowing from banks. No risks for the customer portfolio. Contract's payment terms ensuring the financial exposure of sustainable activities.
INDUSTRIAL RISK		
	Possible external release of radioactive material. Progressive saturation of interim storage facilities both in terms of overall radiological level and available volumes.	Constant review of working procedures and methodologies, in line with the best international practices and based on a continuous dialogue with the regulatory body. Implementation of an environmental and radiological monitoring network. Constant monitoring of available volumes within the storage facilities to arrange alternative solutions when approaching the critical threshold.

NUCLECO		
Risk Category	Risk Factor	Structures and Mitigation actions
REGULATORY RISK		
	Greater restrictions in technical, general and sector regulations which may result in a failure to comply with the new obligations, both in terms of activities and results.	Constant monitoring of reference regulatory framework, including sector and general regulations, also through the support of Sogin and ENEA competent structures.
IMAGE RISK		
	Gap between the perceived image of Nucleco and the Company's identity. Loss of confidence on behalf of public opinion and main stakeholders.	Renewing certifications on Quality, Environment, Workplace Health and Safety and Social Accountability. Taking part in environmental and research events. Internal and external monitoring of Nucleco perceived image. Accurately complying with national laws on transparency, ethics and corruption.
ADMINISTRATIVE RISK		
	Failure to comply with fiscal and budgetary law requirements.	Adoption and regular updating of Model 231/2001, administrative and management processes review, adoption of organic procedures, implementation of integrated IT management systems, also through Sogin systems to enhance the internal control.
RISKS RELATED TO EXOGENOUS FACTORS		
	Changes in technical, sector and general regulations (regulatory risk). Possible redefinition, on behalf of Sogin, of nuclear power plants and fuel cycle facilities decommissioning strategies.	Risks related to low exogenous factors, since legislative actions connected to the tasks appointed to Sogin – also concerning the creation of the National Repository and Technological Park – ensure business continuity.

INTEGRATED MANAGEMENT SYSTEM FOR QUALITY, ENVIRONMENT AND SAFETY

To better pursue its corporate mission and reach institutional objectives, Sogin has an Integrated Management System, certified for Quality (2003), Environment (2013) and Safety (2014), which allows a controlled and consistent management of processes, by integrating quality, environmental protection and Workplace health and safety. Moreover, the corporate management system adopts the provisions of the IAEA GSR Part 2 “Leadership Management for Safety”, under the EU-EMAS regulation No. 1221/2009 (where applicable).

Such tools are included in the **Corporate Policy for Quality, Environment and Safety** signed on 21 December 2017 by the corporate senior management, which formalises the Company commitment in ensuring the health and safety of workers and community, and the protection of the environment, through measures to prevent pollution.

The Policy underlines Sogin compliance with national and international sector regulations, in addition to the IAEA (International Atomic Energy Agency) guidelines and standards. The Integrated Management System is, therefore, also intended as a Nuclear Safety Management System as for the monitoring of nuclear safety aspects.

The Policy is included in training and information activities for workers and stakeholders’ engagement activities.

Certifications

Sogin Integrated Management System is based on the following international standards:

- UNI EN ISO 9001 - quality management systems: the regulation outlines the requirements of a management system for the quality of an organisation. The requirements are of “general nature” and may be implemented by any kind of organisation.
- UNI EN ISO 14001 - environmental management systems: the standard certifies that the organisation has an appropriate management system for monitoring the environmental impacts of its activities, and systematically seeks to improve it in a consistent and efficient way.
- BS OHSAS 18001 - Occupational Health and Safety Assessment Series: international standard for managing the health and safety of workers. In 2018, the switch of the Safety Management System was to the new regulation ISO 45001:2018 was launched, the latter will finally replace the BS OHSAS 18001 standard.

The verification on behalf of the certifying body for the certifications of the Integrated Management System for Quality, Environment and Safety was successfully completed on 30 November 2018.

During the operation, which has involved Caorso, Casaccia, Latina and Rome sites, compliance with decommissioning processes, market activities, engineering, management and support processes with the standards was also evaluated.

Updating of corporate processes

In 2018, Sogin has continued monitoring corporate processes and reviewing procedures of the Integrated Management

System, according to the requirements stated under ISO 9001 and ISO 14001 regulations (corporate context analysis, leadership, risk management and Risk Based Thinking); the Company has also continued integrating criteria of the IAEA GSR Part 2 and adapting to new regulations (Procurement Code and Information Security).

Training was planned and distributed in the framework of maintenance activities included in the Integrated Management System and preparatory operations to migrate to ISO 45001 regulation.

During the first half of 2018, Nucleco has successfully passed the audits for the recertification of quality and environment management systems. Both certifications have switched to the new regulations (2015 version) which include the HLS (High Level Structure), namely a high-level common structure of new ISO standards which facilitates their future integration.

Therefore, the Company moved towards a new kind of process and activity management based on a “risk-based thinking” approach and aimed at identifying, qualifying and managing risks.

In 2018, Nucleco has confirmed the OHSAS 18001 certification on the Occupational Health and Safety of Workers.

Moreover, in the same year, Nucleco has launched preparatory activities to switch to the new UNI ISO 45001 regulation, such operations are expected to be concluded by the first half of 2019. Moreover, the audit to maintain the SA8000 certification on social accountability was also carried out; this international certification standard is based on the principles stated in ILO (International Labour Organisation) conventions and in the Universal Declaration of Human Rights, which aim at improving working conditions by ensuring the respect of human and workers’ rights, protection against child exploitation and conditions of safety and health in the workplace.

AUTHORISATION SYSTEM

Italian nuclear power plants decommissioning and radioactive waste management are activities that require authorisation and approval procedures, which involve several institutional stakeholders, such as the Ministry for Economic Development, the National Inspectorate for nuclear safety and radioprotection (ISIN), the Ministry for the Environment and Protection of the Land and Sea (MATTM), Regions and Municipalities.

The most important authorisation to obtain before dismantling a nuclear power plant is the Decommissioning Decree, which is issued by the Ministry for Economic Development, having listened to the different opinions of the Ministry for the Environment and Protection of Land and Sea, Ministry for the Interior, Social Policies, Health, the Region concerned and the ISIN. This authorisation procedure, included in Legislative Decree No. 230/1995, begins after the submission of a decommissioning request on behalf of Sogin.

So far, the following sites have obtained a decommissioning decree: Bosco Marengo FN facility (2008), Trino and Garigliano nuclear power plants (2012) and Caorso nuclear power plant (2014).

Within the authorisation procedure, additional single decommissioning projects may be authorised, and temporary works and structures may be implemented, in line with the provisions of Legislative Decree No. 230/1995 and Law No. 1860/1962.

Upon reception of the decommissioning decrees or the authorisations for single projects, Sogin is required to submit specific Operational Plans (OP) or Detailed Project Reports (DPR), which report a description of the work to be implemented along with possible considerations on safety and radioprotection; such documents will be subsequently approved by ISIN.



REGULATORY SYSTEM

Financial resources allocated by Sogin for the implementation of decommissioning programmes and radioactive waste safe management and maintenance come from:

1. Funds allocated for “nuclear power plants dismantling” and “nuclear fuel treatment and disposal of”, resulted from the collection of percentages on the sale price of kWh produced, and transferred to Sogin in 1999;
2. Component A_{2RIM} (former A2) of the electricity tariff, monitored on a quarterly base by the Regulatory Authority for Energy, Networks and Environment (ARERA).

ARERA has defined the current system to recognise nuclear operation costs of 2013-2016 period, through resolutions No. 574/2012 and No. 194/2013; the system, with corrective actions, was subsequently extended and applied to 2017, 2018 and 2019.

This system is based on a mechanism of double recognition of the costs, budget and financial statements.

Within the scope of this mechanism, Sogin yearly submits for approval to the Authority:

- The cost estimate for the following financial year and an update of the following four-year programme within 31 October;
- The final statement of the previous year within 28 February.

ARERA approves the cost estimate of activities and recognises the final statement of incurred costs, divided by different recognition modalities and categories, according to efficiency and effectiveness criteria, provided that they are included in the coverage for nuclear expenses as stated under the inter-ministerial Decree of 26 January 2000 (as amended by the inter-ministerial Decree of 3 April 2006).

In the event of delays in achieving milestones, the payment of a penalty - that cannot exceed the profit of the financial year - was added to the classic incentive scheme. Possible surplus in the profits of the financial year is distributed in the following years of the same regulatory period.

The current system divides the costs for nuclear operations in different categories, in addition to taxes and voluntary redundancy incentives, to which a different recognition modality applies:

- **External costs commensurate with the progress** of dismantling operations or related to contracts for the implementation of decommissioning works, including building radioactive waste interim storage facilities and managing the nuclear fuel cycle.
- **Costs with multi-year benefits**, costs incurred for the creation of assets that are not intended to be dismantled and

may be used after the end of the dismantling programme, such as equipment of dosimetry and environmental analysis laboratories, material management and control stations or management software.

- **Mandatory costs**, costs incurred for physical protection, contracts for the supervision of sites and headquarters, insurance cover, mandatory training courses and power plant management and supervisory activities (i.e., environmental radiological monitoring or medical and radiological surveillance of workers). This item also includes costs for “mandatory” staff according to executive regulations, emergency plans or other decrees or law provisions on safety in the workplace.
- **Costs proportional** to the progress of dismantling activities, or consulting costs, professional performances and fixed-term or occasional employment contracts and costs of internal staff (such as the staff employed in design and procurement activities) involved in activities connected to the dismantling.
- **General costs that may be subjected to a reduction**, external costs of various site services and coordination and service costs (which are not mandatory costs connected to dismantling activities), such as costs for green areas, or furniture or office equipment. This item also covers costs of the employed staff.

In order to improve efficiency and effectiveness of the action, the regulatory system also includes an incentive scheme defined through the achievement of specific objectives, with a penalty in the event of delays in achieving the abovementioned objectives. The objectives and targets/projects used to measure the progress of decommissioning activities are:

- **Task drivers**: tasks/projects deemed of strategic value by ARERA; by evaluating them, ARERA assesses the overall progress of decommissioning programme and the recognition of proportional costs (art. 6.7 of ARERA resolution No. 194/2013);
- **Milestones**: specific objectives to be achieved each year, related to several activities deemed relevant by ARERA (also following their submission to ISIN and the Ministry for Economic Development in institutional meetings). Each year of the regulatory period involves a list of milestones defined by the Authority, and each list reports a percentage value.

Therefore, ARERA defines nuclear costs to be covered by the electricity A2RIM component, former A2, and, through specific allotments of the Fund for Energy and Environmental Service, it ensures that Sogin financial needs are covered.

ECONOMIC OUTCOMES

Group production at the end of the financial year was equal to EUR 195.8 million (192.1 in 2017) net of non-recurring items connected to the closing of the nuclear fuel cycle.

During 2018, further actions have been implemented, among which, optimisation of functioning costs, relaunch of working sites and development of cutting-edge engineering decommissioning projects.

In 2018, the value of the activities proportional to the progress of the dismantling of Italian nuclear plants, was equal to EUR 80.7 million: the best result since the Company establishment (+41% compared to 2010-2017 historical average) showing a sharp improvement compared to the 2017 value of EUR 63.2 million.

In 2018, the Group Consolidated Financial Statement also reported a 16.5% increase in EBIT, EUR 12.1 million, compared to EUR 10.4 million recorded in 2017.

Sogin operation result EBIT amounted to EUR 8.0 million (compared to EUR 6.0 million in 2017).

In the same year, further structural reduction of the Group staff has been implemented, with a relevant reduction from 1.210 units in 2017 to 1.173 units as of 31 December 2018 (37 units, or -3%).

If compared to the number of employees recorded as of 31 December 2015 (1.296), the overall staff reduction in a three-year period (2016-2019) amounts to 123 units (-9.5%). With a following cost reduction from EUR 92.8 million in 2016, to EUR 89.0 million in 2017 and, finally, to EUR 86.9 million in 2018 (-5.9 million compared to 2016).

On an overall basis, the Company continues the implementation of cost reduction policies, originally launched in 2016. In 2018, the operational costs recorded by the Group amounted to EUR 126 million (net of proportional, fuel costs, depreciations and allocations) with a reduction of -10% compared to the peak of EUR 140.6 million recorded in 2015.

In 2018, Sogin Group continued ratifying contracts with third parties, both in Italy and abroad, for a total of EUR 14.2 million (+133% compared to 2007-2017 historical average). This outcome, summed to EUR 20.8 million recorded in 2017, leads to a total amount of EUR 35 million for the 2017-2018 two-year period, an amount exceeding the sum collected during the seven previous financial years.

GROUP VALUE CREATION AND DISTRIBUTION

The chart below, drafted in compliance with the GRI Standard requirements, is based on a classification of the Group income as reported in the 2018 consolidated Financial Statement at 31 December 2018, where:

- The generated economic value corresponds to the measurable economic wealth, produced by the Group in the year;
- The distributed economic value is a qualitative-quantitative indicator of the Group social impact and of the distribution of value among different stakeholders;
- The economic value retained within the Group corresponds to the wealth ensuring economic sustainability, and it is reinvested in innovative instruments and services to foster continuous improvement.

Sogin Group value creation and distribution

Figures in millions of EUR

	2018	2017	2016 ⁵
Generated economic value⁶	216.50	416.51	201.82
As for the activities of fuel management and reprocessing	20.2	221.9	11.5
Distributed economic value	195.05	393.00	184.28
Operating costs (value distributed along the supply chain)	98.15	298.09	86.51
Value distributed to employees	86.90	89.05	92.85
Value distributed to the providers of capital	0.04	0.04	0.06
Value distributed to the Public Administration	6.51	5.12	4.16
Value distributed to Shareholders	3.45	0.70	0.70
Value distributed to the Community	0.00	0.00	0.00
Retained economic value	21.45	23.51	17.54

⁵ 2016 figures have been subject to restatement, in line with the operations reported in the Group Consolidated Financial Statements.

⁶ The generated economic value includes approx. EUR 2.5 million of net financial income and charges in addition to EUR 413.9 million of operating revenue, and a negative change of more than EUR 222 million for ongoing construction contracts.

The revenues reported in 2018 Financial Statements equal to more than EUR 426 million and show an increase of more than EUR 200 million compared to 2017. This change can be mainly attributable to the increase of revenues for performances connected to the increase of nuclear activities. However, the significant revenue increase does not offset the strong change of construction contracts which, at 31/12/2018 amounted at approx. EUR -223 million⁷. Due to this change, the economic value generated in 2018 (more than EUR 216 million) significantly decreases compared to 2017 (more than EUR 416 million).

The economic value distributed in 2018, which amounted to approx. EUR 195 million, decreases in relation to 2017 (approx. EUR 393 million), mainly due to the decrease of operating costs. In particular, the value distributed by the Group includes the following entries:

- “Operating Costs (value distributed along the supply chain)”: equal to approx. EUR 98 million, is the share of value distributed to the Group suppliers. The entry includes the purchase costs of raw materials, ancillary and consumables, costs for the use of services, for the execution of works and for the use of third-party assets. Compared to 2017, the entry shows a strong decrease mainly due to the cost reduction for services which shifted from more than EUR 280 million in 2017 to approx. EUR 81 million in 2018. This reduction can be attributable to the relevant reduction of the costs incurred in 2018 compared to 2017 for fuel reprocessing operations.
- “Value distributed to employees”: equal to EUR 86.9 million, is the share of generated economic value distributed to employees, via salaries and wages, social security contributions, severance schemes and services provided to employees (meal services, tickets). Year 2018 maintains the positive efficiency trend started in 2016.
- “Value distributed to capital providers”: equal to approx. EUR 40 thousand, it corresponds to the interest due from Sogin Group to its capital providers. Compared to the previous Financial Statements the value is essentially unchanged.
- “Value distributed to the Public Administration”: equal to approx. EUR 6.5 million, it corresponds to the share of economic value allocated to the Government, by means of tax and social security levy (direct, indirect taxation and paid taxes). 2018 value is largely in line with the value of the previous financial year (equal to approx. EUR 5.12 million).
- “Value distributed to Shareholders”: equal to approx. EUR 3.45 million, is the economic value share distributed by the shareholder of the Ministry for Economy and Finance, as dividends. The 2018 value shows a relevant increase compared to 2017 (equal to approx. EUR 700 thousand) due to the major distributed dividends (approx. EUR 2.4 million distributed by Sogin and EUR 1 million by Nucleco).

The value that was not distributed by the Group to the stakeholders, was internally retained as amortisations (including depreciations) and allotments for risk funds and reserves, and it is used to ensure the Group sustainable growth.

⁷ The changes of construction contracts essentially refer to the income matured upon closing of the financial year for the performance of different nuclear activities, net of the share of changes in inventories of the previous financial year.

2

CLOSING OF THE ITALIAN NUCLEAR FUEL CYCLE

DECOMMISSIONING SITES

Closing the Italian nuclear fuel cycle means restoring the condition of “green field” in the sites that currently house nuclear power plants and facilities, thus returning these areas without radiological restrictions to the community for their reuse. This goal may be attained by implementing a decommissioning programme on Italian nuclear power plants and the management of radioactive waste.

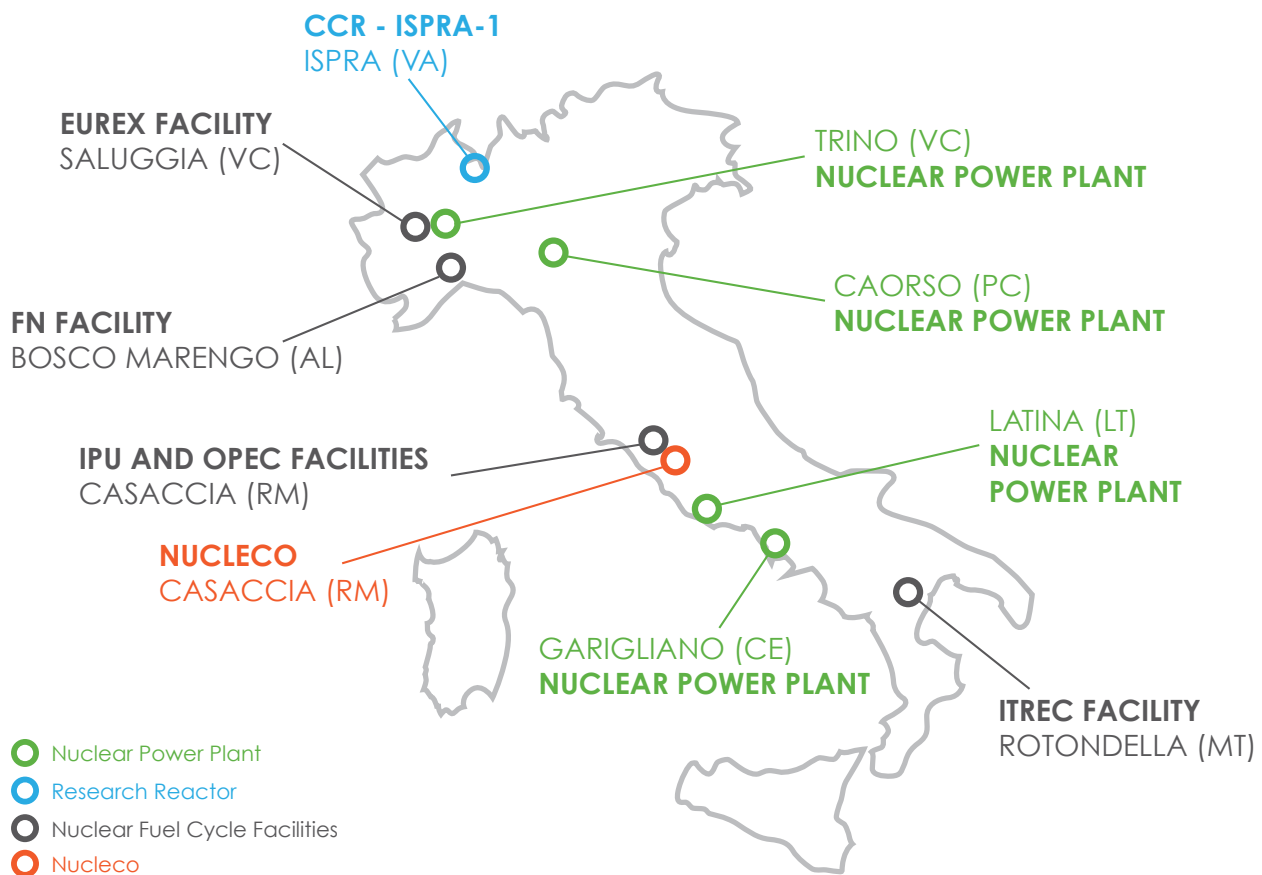
Decommissioning (dismantling) is the last stage of a nuclear power plant lifecycle, after its building and operation stage. The decommissioning process generally involves removing fuel, carrying out the facility radiological characterisation, the decontamination of structures and, lastly, the site radiological characterisation. Any of these operations is carried out in a safe working place. This process also involves managing the radioactive waste stored in specific interim storage facilities, and all other materials resulting from dismantling operations such as iron, copper or concrete, which will be then reused or removed from the site to be recovered and recycled. The demolition of the power plant structures, the conditioning of radioactive waste and its storage in interim facilities ready to be transferred to the National Repository, lead the land to the stage of “brown field”. After the gradual transfer of radioactive waste to the National Repository, the interim storage facilities are also dismantled.

At this stage, after having verified that no radiological risks are present, the brown field becomes a “green field” and the site can be reused by the community.

The decommissioning procedure is an engineering challenge since the Italian nuclear power plants, differing one to one to another, were designed without considering the need to dismantle them at the end of their lifecycle. This requires a complex planning to implement decommissioning programmes in parallel and the development of specific technological solutions, mainly prototypes, non-replicable on an industrial scale.

The Italian nuclear plants and facilities under decommissioning are: the four nuclear power plants of Trino (VC), Caorso (PC), Latina and Garigliano (CE) and the nuclear fuel cycle facilities FN in Bosco Marengo (AL), EUREX in Saluggia (VC), OPEC and IPU in Casaccia (RM) and ITREC in Rotondella (MT).

A map showing the sites under decommissioning is reported below, highlighting the main activities implemented in 2018 along with the relevant topics for stakeholders. In addition to this, the Ispra-1 reactor is shown, which is located within the Joint Research Centre (JRC) of Ispra (VA), and whose decommissioning was appointed to Sogin under 2018 Budget Law. The operation was ratified in May 2019.





HISTORICAL BACKGROUND

Italy was one of the first Countries worldwide to face nuclear decommissioning, when it decided to stop producing nuclear energy in 1987. Following a referendum, the Italian power plants of Latina, Trino (Vercelli) and Caorso (Piacenza) were stopped and turned to a “safe store”, condition already applied to the power plant in Garigliano, closed in 1982. Same applied to the nuclear fuel cycle facilities: Eurex in Saluggia, Ipu and Opec in Casaccia, Itrec in Rotondella and FN facility in Bosco Marengo. In the same year, the construction of Trino2 and Montalto di Castro facilities was also halted.

In 1999, with the liberalisation of the electric sector, privatisation and the partial listing of the ex-monopolist, Italy decided to launch an “accelerated decommissioning” in place of the initially planned “passive security measures”. Sogin was, thus, established to dismantle the four power plants of Trino, Latina, Caorso and Garigliano, to which, in 2003, the three nuclear fuel cycle research facilities were added and, later on, in 2005, the fuel manufacture facility of Bosco Marengo.



TRINO



Location
Vercelli

Reactor Type
PWR - Pressurised
Water Reactor

**Launch of
commercial
operations**
January 1965

**Plant
shutdown**
March 1987

**Launch of
decommissioning**
1999

Brownfield
2031

**Decommissioning
Value**
EUR 242 M



HISTORY OF THE NUCLEAR POWER PLANT

Trino nuclear power plant “Enrico Fermi” was built by a business consortium headed by Edison. Its construction started in 1961. After three years, in 1964, the nuclear plant started producing electric power. The facility, equipped with a PWR (Pressurized Water Reactor), had a power of 270 MWe. In 1966 the ownership passed to Enel and in 1987, following the referendum on nuclear power, the power plant was halted.

In 1990, the power plant was finally deactivated. The plant has produced a total of 26 billion kWh of electric power, reaching the world production record at full power operation. In 1999, Sogin acquired the ownership of the plant aiming at implementing its decommissioning. Trino nuclear power plant was the first Italian nuclear power plant to obtain the Decommissioning Decree in 2012.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT IN 2017

The main decommissioning operations that have been implemented have involved the defueling and the discharge of the control rods from the reactor, the clearance of fresh fuel, the demolition of the auxiliary cooling towers, the decontamination of the steam generators and the dismantling of the emergency diesel buildings. The barrier of the Po river was also removed as well as the component of the turbine building. As for the reactor and turbine building, systems and plants have been adapted to suit dismantling operations. The electrical system of the turbine was modified, and previous radioactive waste were super-compacted, the characterisation station for radioactive waste was also adapted, the tender

for the primary circuit dismantling executive project was awarded, and the area was cleared from the remaining fuel elements sent abroad for reprocessing.

Moreover, a campaign for the repackaging and super-compaction of previous radioactive waste was launched and the mock-up WOX tests have been adapted. The removal of the nuclear fuel loading crane and of non-contaminated components of the reactor building were implemented, and the test tank premise was adapted into an interim storage facility.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT OR STARTED IN 2018

In 2018, the interim Test Tank premise was used by Sogin to store 300 380-litres overpacks in anti-roll cages in line with the latest safety standards, these overpacks are part of the waste located in the two interim storage facilities of the site.

Preliminary design activities for the dismantling of the primary circuit have been launched as well as preliminary tender procedures for the first stage of the vessel characterisation. Preliminary activities for the partial dismantling of the turbines building were launched; such activities involved the reduction of the structure. This operation will result in earlier dismantling of the building and lower maintenance costs. The components of the Radwaste Disposal premise were removed to allow the installation of the WOX plant for spent resins.

Asbestos was removed from the upper part of the vessel and preparatory dismantling works were implemented, among which: radiological characterisation projects, restoring the insulation of the emergency flooding tanks, and the auxiliary systems maintenance.

The design of cementation and management stations for materials and the project for the renovation of D2 Repository were completed. A tender was launched for emptying the pool of purifiers, to arrange the creation of a cementation station and to allow the cutting and storage of activated components. Solid radioactive waste treatment activities were implemented, an interim monitoring station for materials was installed and a specialised company was appointed for sending metal components to Sweden for melting.



STRATEGIC PROJECT: REACTOR DISMANTLING

The project involves the dismantling of internals and vessel in Trino nuclear power plant, and it is divided into 4 stages:

- Preliminary activity (worksites preparation and reactivation of plants and systems);
- Vessel opening, removal of “fake elements”, disassembly of systems and handling of control rods and rod guide tubes;

- Characterisation and dismantling of the vessel upper part and internals;
- Vessel dismantling and neutron and primary screen.

The project is complex due to high radioactivity levels and physical restraints of the areas where the operations should be carried out.

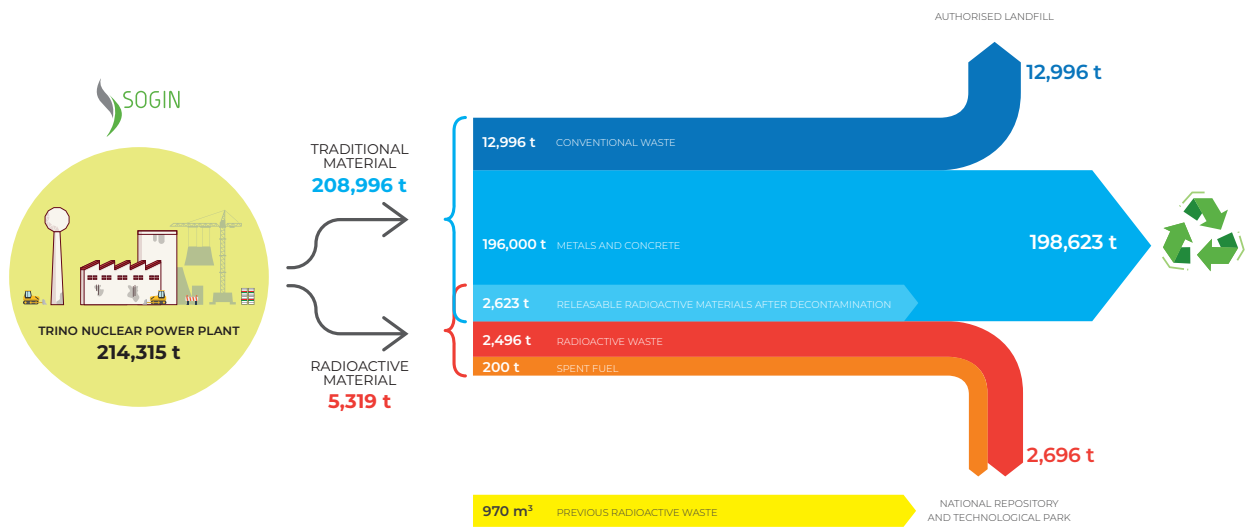


WASTE MANAGEMENT

Radioactive waste stored in the site interim storage facilities amounted to 1,111 cubic metres as of 31/12/2018. Approx. 198,000 (93%) out of 214,000 total tonnes of materials resulted from Trino decommissioning operations, will be recovered and recycled, these materials mainly consist of metals and concrete.

In 2016-2017, for example, the adaptation of the Test Tank into an interim buffer repository for radioactive waste, resulted in approx. 5 tonnes of metallic materials and approx. 850 tonnes of (non-radioactive) concrete; such materials were partly turned into secondary raw materials used to fill the excavation pits and partly sent to external disposal facilities.

WASTE DESTINATION



AUTHORISATIONS

No authorisation for Trino nuclear power plant has been issued in 2018.

CAORSO



Location
Piacenza

Reactor Type
BWR – Boiling
Water Reactor

**Launch of commercial
operations**
1981

**Plant
shutdown**
1986

**Launch of
decommissioning**
1999

Brownfield
2031

**Decommissioning
Value**
EUR 333 M



HISTORY OF THE NUCLEAR POWER PLANT

Caorso nuclear power plant, the largest in Italy, with a capacity of 860 MW, was designed and built in the early Seventies by Enel, Ansaldo Meccanica Nucleare and GETSCO pool of companies.

The plant, of the BWR (Boiling Water Reactor) type, belongs to the second generation of nuclear plants.

Connection to the national grid took place in May 1978 and it went into service in December 1981.

In October 1986, the plant was stopped for periodic fuel charging and was never restarted, also as a following the 1987 referendum on nuclear power.

Although its short period of operation, the nuclear plant produced approx. 29 billion kWh.

In 1999, Sogin acquired the nuclear plant to launch its decommissioning.

Preliminary decommissioning activities were launched upon issue of the Ministerial Decree of the Ministry for Industry, Trade and Handicraft (now Ministry for Economic Development) of 2000, which authorized the accelerate strategy for the nuclear power plant decommissioning.

In 2008, the power plant obtained the Environmental Compatibility Decree (EIA) for decommissioning. In 2014, the Ministry for Economic Development issued a decree for the decommissioning of the nuclear power plant which enables the completion of the decommissioning operations through the design and authorisation of single projects.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT IN 2017

The dismantling operations carried out so far, have mainly involved: the removal of turbines, turboalternator and all the components and systems of the thermal cycle located in the turbine building; the demolition of the Off-Gas building, where flue gasses were treated before being released in the air, and the demolition of the auxiliary cooling towers, and the

RHR (Residual Heat Removal), containing the security system to remove residual heat in the reactor core when the activity was halted for maintenance works or re-fuelling. High-activity components and systems were decontaminated within the reactor building, thus, reducing the radiation level in the areas that will undergo decommissioning operations.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT OR STARTED IN 2018

During 2018, the executive project to adapt to new security standards was completed in the interim low-activity storage facilities of the site (ERSBA 1 and 2).

As for the adaptation of the turbine building into temporary buffer and the implementation of a waste treatment station, the systems and plants have been adapted in 2018 and the super-compaction system has been successfully tested; this system will allow a significant reduction in waste, resulting from the previous operation period of the plant and from future decommissioning activities.

Among the preliminary activities to dismantle the systems and components of the reactor building, adaptation works on the cooling system have been started and the detailed technical design of the Waste Route has been launched, this facility will connect the turbine building with the reactor and the auxiliary building, thus enabling the handling of materials produced while dismantling the reactor vessels and systems. The adaptation of the electric system of the reactor building is currently under implementation.



STRATEGIC PROJECT: RESINS TREATMENT

The project involves the preparation, shipment and treatment of 800 tonnes of ion exchange spent resins and 60 tonnes of radioactive sludges in the Bohunice (Slovakia) facility, it aims at obtaining conditioned final products and reducing by 90% the waste volume.

Treatment will primarily involve incineration, while conditioning operations will be carried out in pods containing radioactive ashes incorporated in a cement matrix within stainless-steel tanks with a capacity of 440 l. After treatment and conditioning, all waste, final products, will return to the site where it will be temporarily stored before being shipped to the National Repository.

The first tanks containing resins have been sent to Bohunice facility in 2017 to run the “cold tests” on the pre-treatment system and the incinerator’s power supply. The project continued in 2018, with the shipment of 336 tanks, containing resins and radioactive sludges, to the Slovakian facility to run hot tests. Moreover, in the same year, a new system for the recovery of storage tanks will be installed within the temporary medium-activity storage facility (ERSMA), this will enable the extraction of approx. 1600 storage tanks from the hot cells and their subsequent treatment and conditioning in the Bohunice facility. Removing resins from Caorso nuclear power plant is a “key” step to empty the site’s temporary storage facilities and perform subsequent adaptation of the premises.

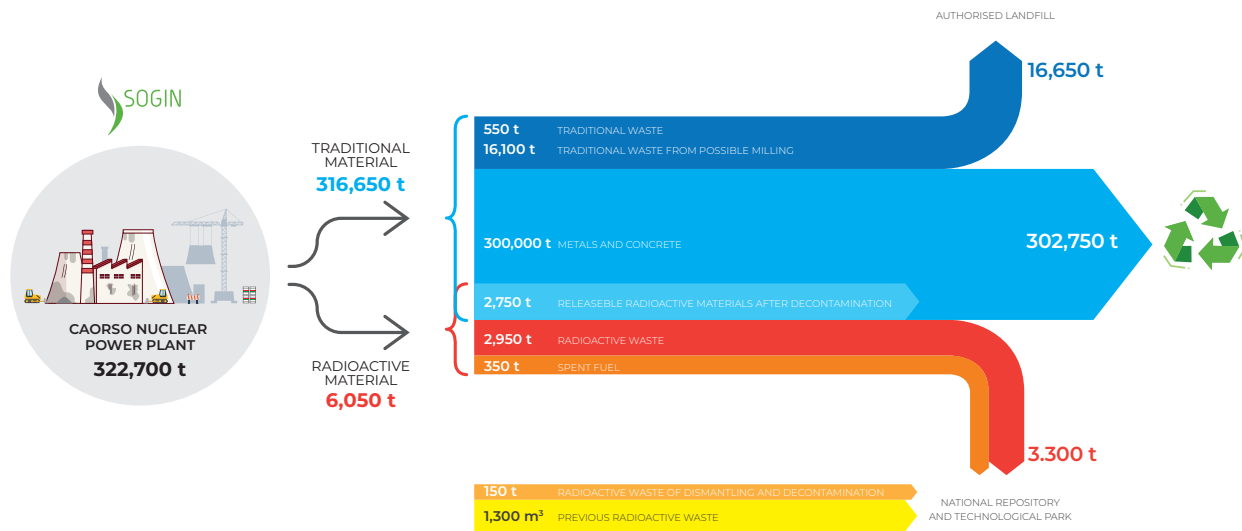


WASTE MANAGEMENT

As of 31/12/2018 the radioactive waste stored in Caorso site amounted to 2,365 cubic metres.
 Approx. 300,000 tonnes (93%) out of 320,000 total tonnes of materials resulted from Caorso decommissioning operations, will be recovered and recycled, these materials mainly consist of metals and concrete. For example, in the period 2013-2014, the dismantling operations of the Off-Gas

building produced approx. 350 tonnes of metallic materials to be sent for recovery and about 7,000 tonnes of non-radioactive concrete, which became primary and secondary raw materials and was reused to fill the excavations resulted from the dismantling of the underground systems adjacent to the building (former hold-up building).

WASTE DESTINATION



AUTHORISATIONS

In 2018, the regulatory body has approved the operative plan for the treatment and conditioning of ion exchange spent resins and radioactive sludges. The body has also approved preliminary operations for the shipment of ion exchange spent resins and radioactive sludges.

LATINA



	Location	Reactor Type	Launch of commercial operations	Plant shutdown	Start of decommissioning	Brownfield	Decommissioning Value
	Latina	GCR - Gas Cooler Reactor	1964	1986	1999	2027	EUR 270 M



HISTORY OF THE NUCLEAR POWER PLANT

Latina nuclear power plant was the first built in Italy, it is a first-generation nuclear facility, equipped with an English reactor with GCR-Magnox graphite-gas technology. The construction of this nuclear plant started in 1958 under the Company Eni. Five years later, in May 1963, the nuclear plant started the production of energy, with a total power of 210 MWe that made it the largest nuclear power plant in Europe. In 1964, it was acquired by Enel and its activities were halted in 1987, following the referendum against nuclear energy.

In its operating period, the nuclear plant produced 26 billion kWh of electricity. In the early Nineties, all the nuclear fuel was sent abroad for reprocessing. In 1999, Sogin acquired the ownership of the plant to implement its decommissioning. The EIA Decree was obtained in 2012, and the plant is now waiting for the Decommissioning Decree on behalf of the Ministry for Economic Development.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT IN 2017

The main dismantling operations carried out so far have involved: the decommissioning of the fuel handling and loading system; the removal of lower and upper pipes of the primary circuit in the reactor building; the nearly complete remediation of spent fuel pools; the demolition of the blower rooms and emergency diesel; the demolition of the pier and the turbine building; the construction of the new interim

storage facility. Recently, the cases of the boilers' blowers were removed, a working site for the creation of a Cutting Facility – to ease the boilers' cutting and dismantling operations – was opened and the KCFC pit was successfully emptied from the concrete tanks containing the filters previously used for treating the water of the fuel pool.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT OR STARTED IN 2018

In 2018, works for the construction of a Cutting Facility continued, this facility will enable the treatment of slightly contaminated metallic materials which will result from future dismantling operations. Specifically, the building foundations have been completed and works for the construction of the building structure have been launched. As for the creation of the Active Effluents Treatment Facility, the detailed technical project has been approved and the storage tanks for liquid materials have been implemented. Moreover, in 2018, hot tests in LECO facility (Latina Extraction and COnditioning) were successfully concluded, this facility is designed for the extraction of the radioactive sludges resulting from previous operations of the nuclear plant. As for the implementation of the super-compaction system, all materials have been shipped to the working site and the

preparatory civil works for the installation of the confinement structure have been launched.

The remediation of the fuel pool has also continued, and, in May 2018, the second stage of the operations was launched and great part of the areas of the nuclear power plant have been successfully waterproofed.

Waterproofing interventions will ensure complete protection of soil and underground water from spillages or possible events occurring during the plant's decommissioning.

In conclusion, surveys have been carried out to perform the radiological characterisation of the soil of the areas located within the protection fence of the nuclear power plant and the encapsulation, removal and remediation of materials containing asbestos were also implemented.



STRATEGIC PROJECT: LECO FACILITY

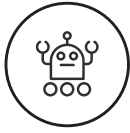
LECO (Latina Extraction and COnditioning) is a facility for extracting and conditioning the radioactive sludges, generated by the active effluent treatment facilities, in cementitious matrixes.

Part of these sludges, about 1.5 cubic metres, are located at the bottom of the fuel pool, while other 13 cubic metres are stored in an underground stainless-steel tank under a 1-meter head of water. LECO facility, built between 2009 and 2017, includes a system for the extraction of the sludges from the underground tank, a plant for the conditioning of the sludges in cementitious matrixes in 440-litre cylindrical tanks and a tunnel connecting the two systems. Between 2017-2018 the systems were installed, and functional tests and inspections were carried out.

Cold tests were also performed, by simulating the whole process to obtain final products, using non-radioactive material, as well as hot tests that led to the production of a radioactive final product. The successful outcome of these tests allowed requesting the authorisation to operate the plant.

All the operations of extraction, transfer, and conditioning in cementitious matrix of radioactive sludges will be carried out remotely through a specific control room.

The 120 final products resulted from the plant's operations will be moved to the new interim storage facility. At the end of the operations, the extraction building, and the sludge pit will be reclaimed and demolished.



WASTE MANAGEMENT

The radioactive waste stored in the interim storage facilities of the site as of 31/12/2018 amounted to 1,756 cubic metres. Approx. 297,000 tonnes (93%) out of 319,000 total tonnes of materials resulted from Latina decommissioning operations, will be recovered and recycled, these materials mainly consist of metals and concrete.

In 2012, the demolition operations of the turbine building resulted in 1,483 tonnes of metallic materials consisting of iron and aluminium, which have been sent for recovery.

WASTE DESTINATION



AUTHORISATIONS



In 2018, the Regulatory body authorised the shipment of a super-compaction and cementation movable system to the site for the treatment of radioactive waste, it has approved an operative plan for the recovery of radioactive sludges and the second stage of the operations to empty the central pool of the connecting tunnel in the pond building.

The Ministry for Economic Development has also authorised the operations to remove the discharge pipelines of the nuclear plant active liquid effluents.

GARIGLIANO



Location Caserta	Reactor Type BWR – Boiling Water Reactor	Launch of commercial operations 1964	Plant shutdown 1978	Launch of decommissioning: 1999	Brownfield 2026	Decommissioning value EUR 383 M
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HISTORY OF THE NUCLEAR POWER PLANT

Garigliano nuclear power plant of Sessa Aurunca was built in four years (1959-1963) by SENN, National Electro-nuclear Company, based on the project of the engineer Riccardo Morandi; the plant started producing electric energy in April 1964. The plant, equipped with a BWR (Boiling Water Reactor) belongs to the first generation of nuclear plants, with an electric capacity equal to 160 MWe. This reactor was the first BWR built in Europe. In 1965, the plant was acquired by Enel. The plant continued being operating until 1978, when it was halted for maintenance operations. In 1982, the nuclear plant was closed.

Since then, structures and plants were kept under safe maintenance to ensure people and environment protection. The plant has produced a total of 12.5 billion kWh of electricity. In 1999, Sogin acquired the plant to carry out its decommissioning. Garigliano plant was the second of the four Italian nuclear plants to obtain the decommissioning Decree in September 2012, approved by the Ministry for Economic Development upon the advice of the Nuclear Safety Authority and other competent institutions.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT IN 2017

The main decommissioning operations carried out so far have involved: asbestos removal from the turbines building and the reactor; the creation of the new radioactive waste interim storage facility (D1); the adaptation of the former diesel building into interim storage facility; the remediation of two trenches, where low-radioactive materials were previously buried and

the containment of the third trench; the dismantling of the old (GECO) facility for the treatment of radioactive slurry waste and part of the old radwaste treatment facility (liquid effluents). The decontamination and demolition of the chimney – nearly 100 metres high - and the dismantling of the turboalternator of the turbine have been also completed.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT OR STARTED IN 2018

In 2018, preliminary activities for the dismantling of the nuclear island were carried out, this was the core of the nuclear power plant, where electricity was produced from nuclear energy. It is the most difficult part to dismantle, since it contains most of the residual radioactivity of the nuclear plant. In 2018, the local channel reactor was opened and the biological screen of the vessel – cylindrical container of the nuclear reactor – was removed.

Moreover, dismantling, cutting, clearance and recycling operations were carried out on the materials resulted from the rotor and the stator of the turbine alternator, while preliminary works have continued for the remediation of trench 1, started in 2017.

As for the new radwaste treatment system, the external walls of the structure have been completed and preliminary civil works for the installation of the new plants have been implemented.

During 2018, the new chimney of the power plant was operated, this structure enables the safe discharge of the flue gasses resulted from safe maintenance and subsequent decommissioning operations. Renovation of the water intake structure has continued with the restoration of water intake and filtration systems, the removal of the sludges stored in the pool and the transfer of materials to treatment and recovery facilities.



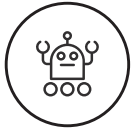
STRATEGIC PROJECT: DISMANTLING OF THE TURBINE BUILDING SYSTEMS

The turbine building houses the systems and components that enabled the production of electricity from the thermal energy generated in the nuclear reaction. With a weight of 1,800 tonnes (400 t rotor and alternator, 450 t condenser and 950 turbine structure), the turbine system is the biggest component of the thermal cycle.

In 2016, preliminary activities were carried out for the decommissioning and restoration of the building's auxiliary systems.

At the end of 2018, dismantling, cutting, clearance and recycling operations were completed for the materials resulted from the rotor and the stator of the turbine alternator. The rotor, a cylindrical structure weighting 105 t, made in iron and copper, was extracted and cut in two with a diamond wire. Subsequently, the alternator - made of iron, copper and plastic and weighting 296 t - was removed and cut after removing the asbestos.

The dismantling of the turbine is expected to be completed by 2020.

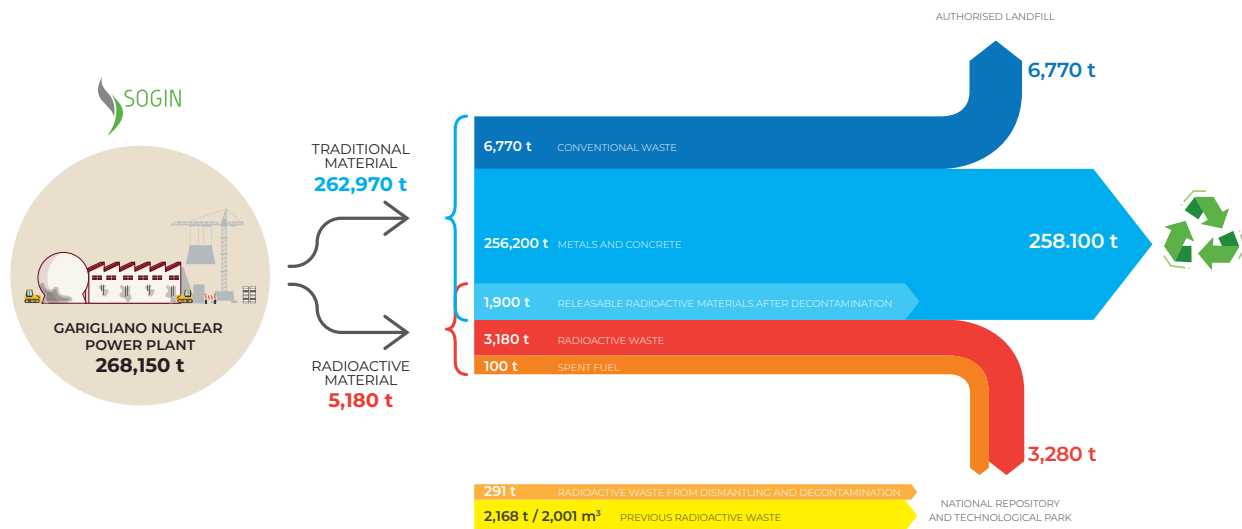


WASTE MANAGEMENT

The radioactive waste stored in the interim storage facilities of the site as of 31/12/2018 amounted to 2,965 cubic metres. Approx. 258,000 tonnes (96%) out of 268,000 total tonnes of materials resulted from Garigliano decommissioning operations, will be recovered and recycled, these materials mainly consist of metals and concrete.

In the 2016-2018 period, dismantling operations of the rotor and the alternator of Garigliano nuclear power plant resulted in approx. 400 t of material. 96% of this material (iron, copper and plastic) was transferred to a licensed recovery facility and addressed to manufacturing centres, such as smelters for iron.

WASTE DESTINATION



AUTHORISATIONS

In 2018, the regulatory body authorised the project for the restoration of the pool in the reactor building to implement decommissioning operations, and the project for the implementation of the new gas waste discharge point.

SALUGGIA



Location	Type	Launch of operations	Stop of research activity	Launch of decommissioning	Brownfield	Decommissioning Value
Vercelli	Nuclear Fuel Cycle Research Facility	1970	1984	2003	2036	EUR 475 M



HISTORY OF THE PLANT

The EUREX (Enriched URanium Extraction) plant was built in 1965. The facility was made operational in 1970 and performed research activities on the reprocessing of irradiated fuels. The plant operation lasted until 1984. Since

then, the safe maintenance of plants and structures has been implemented to protect people and environment. At the end of 2014, a request for decommissioning was submitted under art. 55 of the Legislative Decree No. 230/95.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT IN 2017

Main decommissioning activities of the plant involved projects to improve the safety of the site, such as the construction of a perimeter hydraulic defence from flood events and the construction of the New Waste Storage Tank Facility, a bunker structure for the storage of liquid radioactive waste. Moreover, the storage pool of irradiated nuclear fuel elements was emptied and reclaimed, the new water supply system for the industrial water distribution

network and the new electricity sub-station to supply electricity to the new plants have been installed. The solid radioactive waste interim storage facility D2 was created and it will be operative upon reception of due authorisation. The construction of the new CEMEX complex for the conditioning of liquid radioactive waste was launched. The final conditioned product will be stored in the D3 storage facility, before its transfer to the National Repository.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT OR STARTED IN 2018

In 2018, the characterisation and conditioning programmes for previous solid waste continued, including both the so called “anomalous” IFEC (Fuel Elements Manufacturing Plant) waste and the materials stored in RIBA tanks. A sampling programme on organic liquid and liquid fractions taken from the storage tank was implemented through a specifically designed system. The samples have been subject to a characterisation process in the internal laboratories to optimise pre-qualification tests of the matrixes and treatment process.

Some preliminary activities have been implemented, among which the operation of the internal road network, connecting building 2300 to the interim storage facility D2, the stage III of the installation of subservice pipelines and the installation of monitoring systems in the recirculation tank A, the launch of the decontamination and dismantling project of the UMCP plant and the related simulation plan for decontamination and dismantling operations of the gloveboxes, after which blank tests will be implemented.



STRATEGIC PROJECT: IFEC WASTE

The project envisages the treatment and conditioning of the radioactive waste resulted from the dismantling of the IFEC - Fuel Elements Manufacturing Plant and it is divided in three stages:

- decontamination, repackaging and pre-characterisation in EUREX plant;
- treatment, conditioning and final characterisation in Nucleco plant;

- final product storage in the temporary repositories of Saluggia site.

The complexity of the project is connected to the treatment of approx. 100 t of solid radioactive waste, of which about 35 t of big size waste with significant radioactivity levels. Methodologies used are waste super-compaction and non-homogeneous cementation in overpack containers.



WASTE MANAGEMENT

The radioactive waste stored in the repositories of the site at 31/12/2018 amounted to 2,918 cubic metres. Approx. 34,000 (44%) out of the total 77,000 tonnes of

materials resulted from the decommissioning of Saluggia EUREX plant will be recovered and recycled; these materials mainly consist of metals and concrete.

WASTE DESTINATION



AUTHORISATIONS



In 2018, the operating licenses of the New Waste Storage Tank Facility and the new sub-station for the transformation and supply of electricity to Saluggia plant have been obtained by Decrees of the Ministry for Economic Development.

In 2018, ISIN has approved the characterisation plan for previous solid radioactive waste, while Saluggia municipality has issued the landscaping authorisation for the implementation of a cabin to reduce methane gas emissions to convert the power supply of the site thermal plant and to temporarily cover the supply of the Cemex complex.

BOSCO MARENGO



Location	Type	Launch of operations	Stop of nuclear fuel production	Launch of decommissioning	Brownfield	Decommissioning Value
Alessandria	Fuel Production Plant	1974	1995	2005	2019	EUR 33 M



HISTORY OF THE PLANT

Bosco Marengo (Fabbricazioni Nucleari) Nuclear Fabrications plant, built in the early Seventies, takes its name from the building company “Fabbricazioni Nucleari S.p.A.”. The plant activities, started in 1973, have produced fuel elements to supply Italian and foreign nuclear plants. From 1987, after the closing of the nuclear programme in Italy, the plant has gradually switched its production to advanced ceramic products such as: arthroplasty elements, porous

components for industrial fuel cells, cutting-tools units and similar products. In 1989, ENEA acquired the plant and, in 1995, all nuclear activities were halted. Since then, traditional technological activities have been implemented and the safe maintenance of the structures was ensured. In 2005, Sogin acquired the plant and the nuclear part of the FN staff to carry out its decommissioning.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT IN 2017

Main decommissioning operations carried out so far have involved the dismantling of the fuel production plant and its auxiliary plants. Solid radioactive waste resulted from the dismantling, along with previous waste resulted from the plant's operations, have undergone super-compaction and conditioning treatments through cementation in the Nucleco

plant of Casaccia: the final products have returned to Bosco Marengo site to be safely stored in the temporary buffer station BLD11: they will be stored in the facility until completion of the adaptation works of the B106 premise into a radioactive waste interim storage facility, where the waste will remain until it is transferred to the National Repository.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT OR STARTED IN 2018

In 2018, the adaptation of B106 premise into a radioactive waste interim storage facility was carried out. Upon completion of these works, all radioactive waste of the site will be transferred from building BLD11 to the premise B106. Civil works and structural metalworks and adaptations have been completed and the installation of storage systems and plants was started.

Within the premises of the controlled area (buildings BLD1 and BLD2), the dismantling of auxiliary systems and the characterisation operations to declassify the areas were completed.

Operations have been completed in terms of super-compaction of tanks and treatment of liquid radioactive waste, for which blank tests have been performed, to verify the accuracy of solidification techniques.

In 2018, works have started to connect the new water reservoir to the fire-proofing system. This action, ordered by the Regulatory Body, guarantees, if needed, a greater quantity of water, shifting from the current capacity of 80 cubic metres of the suspended water tank to a capacity of 1,200 cubic metres of the new reservoir.



STRATEGIC PROJECT: SOLID AND LIQUID RADIOACTIVE WASTE TREATMENT

The plant operation period resulted in the production of 390 220-litres tanks containing solid radioactive waste, in addition to 741 tanks resulted from the decommissioning operations of the period 2009-2018. All tanks have been shipped to Nucleco for treatment, super-compaction and conditioning through cementation. In 2018, a total of 1,060 tanks have been compacted that resulted in 380 final products (380-litres overpacks), 330 out of which have already returned to Bosco Marengo.

Super-compaction operations are expected to conclude by the first half of 2019 with the return of the last overpacks to the site.

Moreover, blank tests are currently being implemented for the treatment of the few VLL (very low-level) and LL (low-level) radioactive liquid waste located in the site (approx. 2 cubic metres) and resulted from the site's operation period. Upon completion of the tests and reception of the approval of the control authority, the waste will be solidified through a special polymer and cement dust to be ready for shipment. The final products will be sent to Nucleco to be collected in overpacks and conditioned through cementation.

Final products will then return to the site to be temporarily stored in Bosco Marengo, and subsequently sent to the National Repository.

Treatment activities for radioactive solid and liquid waste is expected to be completed by 2019.

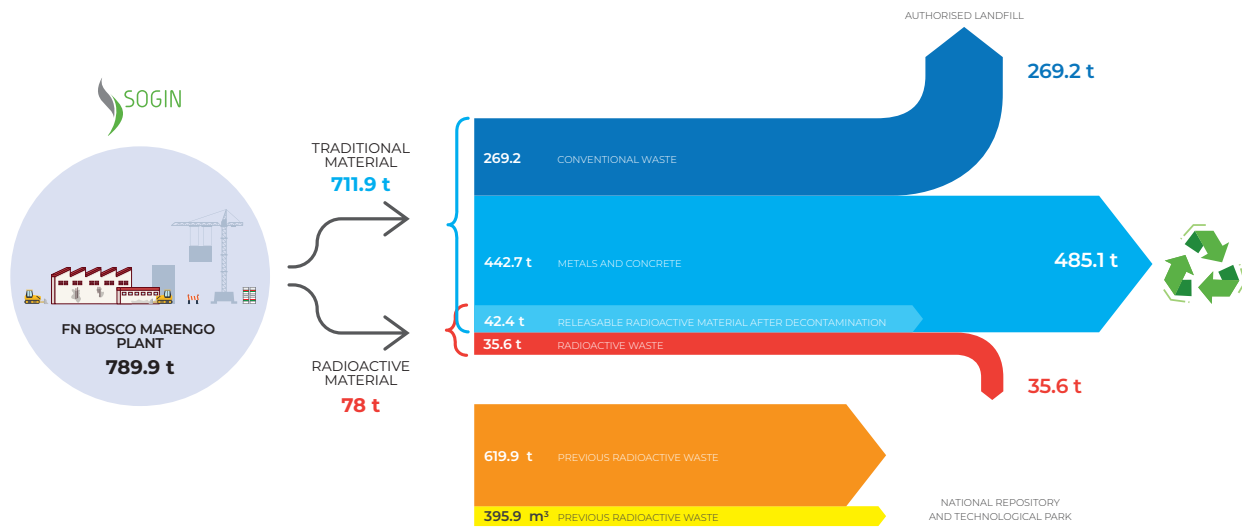


WASTE MANAGEMENT

The radioactive waste stored in the interim storage facilities of the site as of 31/12/2018 amounted to 430 cubic metres. Approx. 485 (61%) out of the total 789 tonnes of materials resulted from the decommissioning of the FN plant will be

recovered and recycled; these materials mainly consist of metals and concrete.

WASTE DESTINATION



AUTHORISATIONS

In 2018, the regulatory body has approved the treatment procedures for medium-level waste and the Single Environmental Authorisation was amended.

CASACCIA



Location	Type	Launch of operations	Stop of research activity	Launch of decommissioning	Brownfield	Decommissioning Value
Roma	Nuclear fuel cycle research plants (Plutonium and Hot-Cell Operations)	Plutonium Plant - 1968 OPEC 1 - 1962 OPEC 2 - operations have never started	1987	2003	2029	EUR 223 M



HISTORY OF THE PLANTS

Since 2003, Sogin manages the OPEC (Boilers Operations) plant and the IPU (Plutonium Plant) plant located in the ENEA Research Centre of Casaccia.

OPEC-1 activities were originally launched in 1962; this was the first Italian facility to carry out research and analysis on nuclear post-irradiated fuel elements. The structure is now used as a temporary repository and it contains an inventory of irradiated materials resulted from different research processes and to be used in destructive tests.

OPEC-2 repository, located next to OPEC-1, was built in the Seventies to expand nuclear research, control and analysis activities previously carried out in OPEC-1; unfortunately, its activity has never started. Today, OPEC-2 has been readapted into a temporary repository for radioactive waste.

The IPU plant was designed and built in the Seventies and its activities started in 1968; it mostly carried out research activities on nuclear fuel elements production technologies. In 1990, after closing the Italian nuclear programme, research activities were halted.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT IN 2017

The main decommissioning operations carried out so far have involved the dismantling of obsolete Glove Boxes of the Plutonium Plant (IPU), the removal of underground tanks “Waste A” and “Waste B” previously used to collect radioactive liquids resulting from OPEC-1 hot cells, the structural and system adaptation of OPEC-2 building into an

interim storage facility for alpha-contaminated radioactive waste, the radiological characterisation of waste and plants, the preliminary structural and plant arrangements for decommissioning and the treatment and conditioning of radioactive waste.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT OR STARTED IN 2018

In 2018, radioactive waste located in OPEC and IPU plants were treated and conditioned. A feasibility study is under implementation for the treatment and conditioning of liquid organic waste in IPU plant and for organic and low-activity aqueous liquid waste currently located in Nucleco.

In OPEC plant, works have been completed for the implementation of the interim storage facility for special waste and the final adaptation project is ready for the interim characterisation of potentially removable materials of building C-14.

As for IPU plant, the qualification activity for the conditioning of aqueous liquid waste and the installation works of a new inspection and repackaging tent for the resulting radioactive waste have been completed.

Moreover, the definitive project for the new storage systems of the nuclear storage facility and the definitive project for the adaptation of the electric system in the controlled area have been completed. As for the “Waste A and B Dismantling” project, namely the tanks of the OPEC-1 radioactive waste underground collection system, a feasibility study for the remediation of underground structures and the recovery of the areas has been finalised.

The definitive project has been finalised and authorisation procedures have been launched for the creation of Casaccia Chemical Laboratory (LACC), which will support radioactive waste management operations.

The dismantling of fourth-level Glove Boxes is still under implementation.



STRATEGIC PROJECT: DISMANTLING OF GLOVE BOXES

The term Gloveboxes refers to confining spaces which, during the operations, were used to manipulate Plutonium for research activities aimed at the production of nuclear fuel elements.

The 56 Glove Boxes of the Plutonium Plant are divided into four levels of complexity, related to size and content, and to the difficulties arising from decommissioning projects and operations. This project is the most relevant decommissioning operation to be implemented in Casaccia site and it entails an initial stage of design and equipment supply, such as, alpha-sealed containment curtains, cutting tools and Glove Box handling systems.

The operations are carried out by Sogin staff in specific containment curtains equipped with gloved tunnels to perform dismantling operations from the outside.

The first Glove Box was dismantled in 2010. From 2012 to 2014 all 1st and 2nd-level gloveboxes have been dismantled. In 2016, 3rd-level Glove Boxes have been dismantled and works for the dismantling of 4th-level Glove Boxes have been initiated, with higher complexity due to their size and content. During 2018, 4 Glove Boxes have been dismantled and works have been launched to dismantle 4 more Glove Boxes.

At the end of 2018, 45 Glove Boxes have been dismantled.

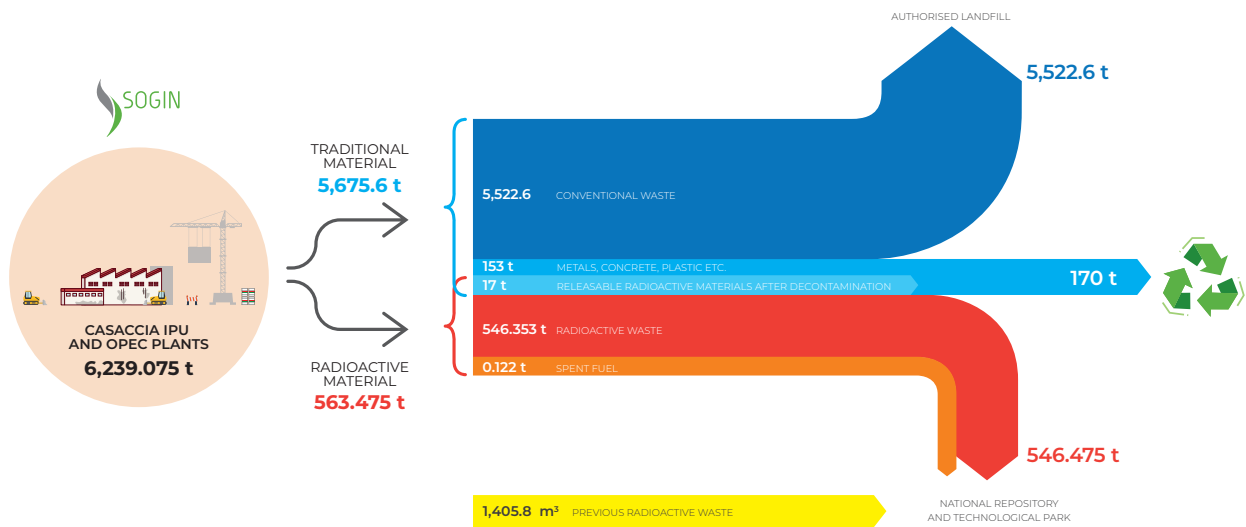


WASTE MANAGEMENT

The radioactive waste stored in the interim storage facilities of the site as of 31/12/2018 amounted to 189 cubic metres. Approx. 170 (3%) out of the total 6,000 tonnes of materials

resulted from the decommissioning of the IPU and OPEC plants will be recovered and recycled; these materials mainly consist of metals, concrete and plastic.

WASTE DESTINATION



AUTHORISATIONS

In 2018, the Ministry for Economic Development has issued an operative authorisation for OPEC-2 interim storage facility. ISIN has subsequently approved the “Surveillance Standards” for this facility.

ROTONDELLA



Location	Type	Launch of operations	Stop of the research activity	Launch of decommissioning	Brownfield	Decommissioning Value
Matera	Nuclear fuel cycle research centre	1975	1987	2003	2036	EUR 282 M



HISTORY OF THE PLANT

The ITREC plant (Treatment and Re-manufacturing Plant for fuel elements) is located within the Trisaia Research Centre ENEA in Rotondella (MT) and it was built between 1960 and 1970 by CNEN (National Committee for Nuclear Energy). Between 1968 and 1970, 84 irradiated Uranium-Thorium fuel elements were shipped to the plant from the experimental reactor Elk River (Minnesota). Subsequently, researches have been conducted on reprocessing and remanufacturing operations for the

Uranium-Thorium cycle to assess the technical and economic viability of the latter compared to the traditionally implemented Uranium-Plutonium cycle. In 1973, CNEN acquired the ownership of the 84 fuel elements from Elk River and reprocessed 20 of these elements. In 1987, following the referendum on nuclear power plants, all activities have been suspended. Since then, the safe maintenance of the site was implemented. In 2003, Sogin acquired the plant in order to carry out its decommissioning.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT IN 2017

The main decommissioning operations implemented so far have involved the decontamination of the discharge pipe at sea, the launch of remediation of Pit 7.1 which contains an underground reinforced concrete “monolith” filled with radioactive waste, the implementation of the working site for the construction of the ICPF (Final Product Cementation Plant), the facility intended for the cementation of the liquid Uranium-

Thorium solution (the so called “final product”) resulting from the experimental reprocessing operations performed on fuel during the plant activity, the characterisation, treatment and conditioning of solid waste resulting from previous safe maintenance operations, the remediation of premise 115 – the so called “corridor” from previously used materials and equipment which may be contaminated.



MAIN DECOMMISSIONING OPERATIONS CARRIED OUT OR STARTED IN 2018

In 2018, within the scope of the ICPF (Final product Cementation Plant) project, extraordinary monitoring campaigns on underground water have been implemented and environmental monitoring activities have been launched. Moreover, works for the partial continuation of civil works have been launched in the process building to install remote-controlled systems for the cementation of the liquid solution, and a tender was launched to complete the works of the interim storage facility (DMC3/DTC3); the tender will conclude and the project will be awarded by 2019. In the framework of the SiRiS (Solid Waste Placement) project, radiological characterisation has been performed

on 436 standard oil tanks containing solid radioactive waste resulted from the plant safe maintenance and preliminary decommissioning operations, and the super-compaction of 397 standard oil tanks containing solid radioactive waste resulted in 64 overpacks.

Moreover, as for the remediation of Pit 7.1, operations have been finalised for the monolith stabilisation through specifically designed and implemented metallic structures.

Finally, as for the dry storage operations to be implemented on Elk River fuel, the operations of third batch in the supply contract concerning the storage casks of fuel elements have been launched.



STRATEGIC PROJECT: REMEDIATION OF PIT 7.1

Pit 7.1 is an area designed and built in the Sixties; this structure consists in an underground monolith containing solid high-level waste resulting from fuel reprocessing activities. The monolith is a vertical prism-shaped structure with a volume of 54 cubic metres and weighing 130 t, located at a depth of 6.5 metres; the structure divided into four square-section wells, contains high-level waste in 220-litres oil tanks, enclosed in cementitious mortar.

As for the remediation of Pit 7.1, the cutting operations and subsequent removal of the monolith have involved a prototype design and engineering solution, since no similar operations have been previously carried out at an

international level. The identified solution involves remote cutting operations performed in the monolith confined space. Moreover, due to its size, a stabilisation and lifting system for the monolith was designed and developed.

In 2018, final operations for the stabilisation of the monolith have been completed through specifically designed and implemented metallic structures suitable for bearing the weight (33 t) of each well and the following handling operations of the monolith.

In April 2018, before implementing the horizontal cut of the monolith, works were suspended for nuclear safety reasons beyond remediation operations.

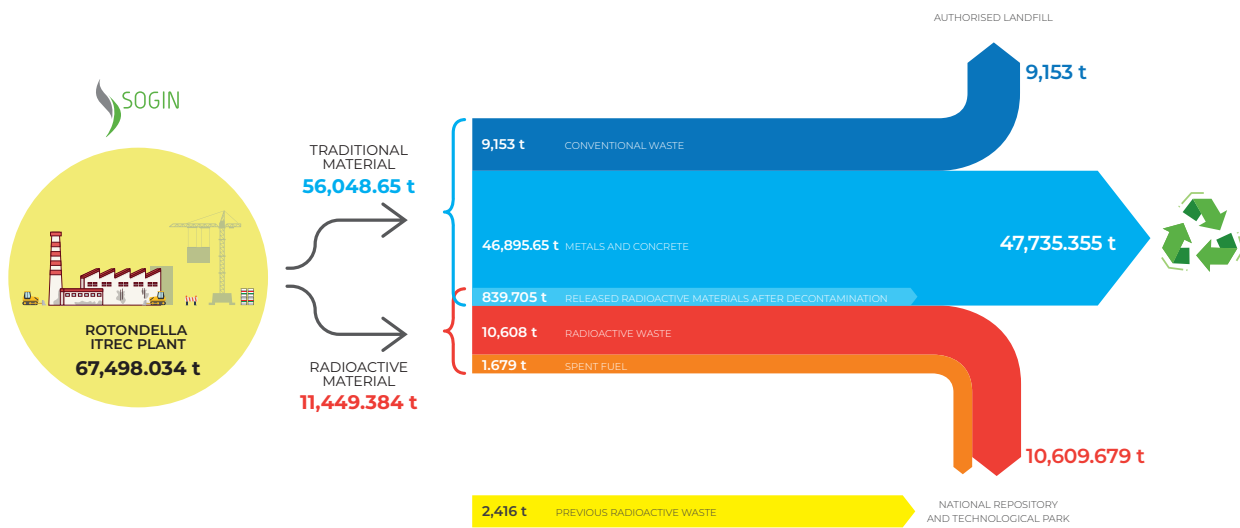


WASTE MANAGEMENT

The radioactive waste stored in the interim storage facilities of the site as of 31/12/2018 amounted to 3,214 cubic metres. Approx. 47,000 (71%) out of the total 67,000 tonnes resulted

from the decommissioning of the ITREC plant will be recovered and recycled; these materials mainly consist of metals and concrete.

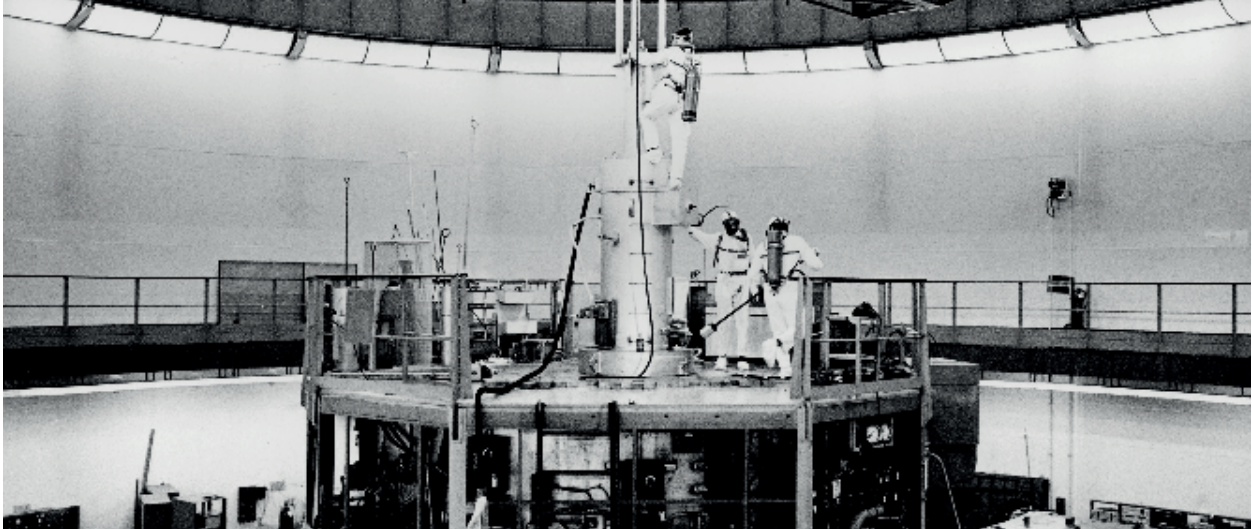
WASTE DESTINATION



AUTHORISATIONS

In 2018, authorisations to complete the construction works of the Final Product Cementation Plant and the Underground Water Treatment Plant were issued. Moreover, an update of the Single Environmental Authorisation was also obtained.

ISPRA-1 REACTOR



Location
JRC –
Varese

Reactor Type
Chicago Pile 5

Gross electric Power
5 MW

Launch of Operations
1959

Shutdown
1973

Produced energy (MWd)
13,500

Assignment to Sogin
2018



HISTORY OF THE REACTOR

Ispra-1 is 5MW research reactor, the last version of the Chicago-Pile 5 series developed by Enrico Fermi, built by the National Nuclear Research Council - later CNEN, finally ENEA - between 1957 and 1958. Becoming operational in 1959 and used until 1973, it was the first Italian research reactor. With the establishment of the European Atomic Energy Community (CEEA), in 1957, the Ispra Nuclear Studies Centre was assigned to the CEEA by Italy in 1959, for a period of 90 years, while the Ispra-1 reactor was entrusted to the management of EURATOM starting from March 1, 1963.

The reactor was used to carry out studies and researches on core physics, new materials for the construction of commercial reactors, neutron fluxes and their interactions with living matter, and it played a role in training a new generation of technicians for Italian and European nuclear programmes. Following the CEEA decision to dismantle obsolete nuclear installations, on 27 November 2009, an agreement between the Italian Government and the CEEA was signed, through which the Ispra-1 reactor returned to the Italian management for its decommissioning.



ASSIGNMENT TO SOGIN

In 2018, with the 2018 Budget Law⁸ that implemented the agreement signed with the CEEA on 27 November 2009, the Italian Government entrusted Sogin with the decommissioning of the Ispra-1 reactor located in the Ispra (Varese) Joint Research Centre (JRC) of the European Commission. In 2018, Sogin launched the first activities to take charge of the plant. Currently, Sogin staff works in concert with the JRC staff to acquire the adequate knowledge of the site.

The operations launched during the initial period include perimeter and identification of the industrial area and the assets that will be affected by the works together with a cognitive survey of an administrative and technical nature. These include legal details, accounting and administrative analysis of previous costs, and environmental and radiological reports.

⁸ Law of 8 May 2019, agreement ratification No. 40, signed in 2009 by the Italian Government and the European Commission, was approved by the Parliament and published on 21 May 2019 on the Italian Official Journal. This law, in force from 22 May 2019, enables the definitive assignment of the plant and its ownership to Sogin; the transfer will be regulated by a taking-over act containing the description of the plant, the competent area and the asset and structure inventory.

FUEL AND NUCLEAR MATERIAL MANAGEMENT

IRRADIATED FUEL

At the end of its lifecycle, the fuel is removed from the nuclear reactor; at this stage it takes the name of “irradiated fuel”. Irradiated fuel contains approx. 97% of the radioactivity connected to the nuclear site.

The irradiated fuel resulted from the operations of the Italian nuclear power plants amounts to about 1,864 t, of which 99% was sent abroad for reprocessing.

Approx. 913 t of fuel out of the total, were reprocessed abroad. Under former terminated Enel contracts, resulting nuclear materials have been already alienated.

The remaining 951 t fall under the reprocessing contracts signed between Sogin, the French Company ORANO (former AREVA) and the English NDA (Nuclear Decommissioning Authority).

Irradiated fuel sent abroad under ongoing reprocessing contracts

Destination	Mass ⁹	Number of elements/Type	Origin	No. of executed transports
United Kingdom (Sellafield - Dounreay) (1969-2005) ¹⁰	716.3 t ¹¹	50893 + 19 rods/ BWR, PWR, MAGNOX	Garigliano, Trino, Latina	102
	190.4 t	1032 + 6 rods/ BWR • 52 cruciform fuel PWR elements Trino	Caorso	16
France (La Hague) (2007-2015)	16.8 t	• 48 PWR squared fuel elements Trino • 48 BWR semi-rods Garigliano	Avogadro Storage Facility	5
	14.5 t	47 PWR fuel elements among which: • 39 UO2 elements • 8 MOX	Trino	2
Total	938 t			125

Irradiated fuel managed by Sogin still located in Italy

Destination	Mass	Number of elements/Type	No. of executed transports
France (La Hague)	13.2 t ¹²	64 fuel elements • 63 MOX BWR Garigliano • 1 square PWR fuel element Trino	3
To be defined	0.115 t ¹³	• Rods, pieces and samples	To be defined
National Repository	1.679 t ¹⁴	• 64 Elk River elements (enriched Uranium and Thorium)	To be defined

⁹ Mass of heavy metal before radiation.

¹⁰ In 2014, the Nuclear Decommissioning Authority has finalised the treatment of the last Sogin fuel batch located in Sellafield, in the UK.

¹¹ The reported quantity includes the fuel resulted from Garigliano 19 rods sent to Dounreay (Scotland) by ENEA: the contract was terminated in July 2017 in during the negotiations with the NDA on the agreements for replacement, minimisation and return of residual materials.

¹² Mass of heavy metal before radiation.

¹³ Mass of heavy metal after radiation. Value according to the Euratom report.

¹⁴ Mass of heavy metal after radiation. Value according to the Euratom report.

WASTE RESULTED FROM REPROCESSING

Based on the agreements ratified with the French company ORANO and the English Company NDA, the waste resulted from reprocessing will return to Italy to be temporarily stored in the interim high-activity storage of the National Repository.

France Waste – based on the agreements ratified with ORANO, 16.3 cubic metres of high-level vitrified waste and 50.4 cubic metres of compacted metal waste, net of transport and storage casks, is expected to return to Italy.

UK Waste – Following the agreement ratified between Sogin and NDA, on 17 July 2017, about the replacement of waste resulted from the reprocessing of the Italian fuel in the UK, which is subject to the guidelines of the Ministry for Economic Development of 10 August 2009, the maximum volume of vitrified waste to be stored in the National Repository may range between the previously estimated 18.7 cubic metres of 104 residual waste and 20.16 cubic metres of 112 residual waste according to the technical features of the 4 casks.

NUCLEAR MATERIALS

The following table shows the Uranium and Plutonium quantities owned by Sogin, resulted from reprocessing procedures and updated in line with the agreement ratified in 2017 with the reprocessing companies.

As for the fissile materials resulted from reprocessing in France and the UK, the MAP 5023 Directive of 28 March 2006 on “*Sogin SpA Strategic guidelines for the treatment and reprocessing abroad of irradiated nuclear fuel from decommissioned nuclear power plants*” envisages a transfer

for valuable consideration. Sogin no longer holds fissile plutonium in France, following the implementation of the Plutonium Management Contract and corresponding Amendment and Supplementary Agreement of 5 December 2017, with which an agreement was ratified to transfer the ownership of the total fissile plutonium (205 Kg) to ORANO. The agreement was effectively implemented starting from 12 January 2018 with the countersignature of ESA (Euratom Supply Agency).

Nuclear Materials

Allocation Country	Allocated quantities		Estimated total quantity at the end of the allocation to UK in case of transfer completion and implementation of reprocessing procedures in F	
	Uranium [t]	Fissile Plutonium [kg]	Uranium [t]	Fissile Plutonium [kg]
UK (Sellafield)	676	832 ¹⁵	701	1045 ¹⁶
F (La Hague)	187.6	0 ¹⁷	228	164 ¹⁸

GLOBAL THREAT REDUCTION INITIATIVE

The GTRI (Global Threat Reduction Initiative) was a programme aimed at restoring the control of the US government on some sensitive nuclear materials that were previously exported to several Countries for industrial (energy production) or research purposes to avoid their use in possible terrorist attacks.

These materials include the plutonium-based materials or the high-enriched uranium which were safely within three Italian facilities: EUREX in Saluggia, IPU and OPEC in Casaccia and ITREC in Rotondella.

Italy has, therefore, joined the GTRI programme to implement the functional decommissioning of nuclear power plants. The clearance of nuclear materials stored on the national territory ended in 2014.

To reach this outcome, GTRI and Sogin has overcome technical challenges, such as the coordination of transports and the development of new plutonium repackaging gloveboxes and a new process to turn high-enriched uranium from a solution into an oxide.

¹⁵ Total quantities reported on the dates on which they were allocated to Sogin by INS.

¹⁶ Quantity estimated at 31/12/2018, considering the decay of quantities already allocated and to be allocated to Sogin by INS, based on Enel figures upon the reactor unloading.

¹⁷ The plutonium resulting from the reprocessing of nuclear fuel delivered to France at 31/12/2018 was completely transferred for valuable consideration based on the agreements ratified between Sogin and ORANO.

¹⁸ Quantity calculated at 31/12/2018, considering the decay starting from Enel figures upon the reactor unloading. The quantity reported in the table corresponds to the estimated quantity of fissile plutonium which ownership was not transferred to ORANO.

WASTE MANAGEMENT

During the lifecycle of a nuclear power plant, that includes the operation period and the decommissioning stage, two main type of waste are produced:

- **Radioactive waste**, with a radiological content, that is classified according to categories according to the concentration of radionuclides and the radioactivity decay time;
- **Conventional waste**, resulting from standard industrial processes, which, in turn, is divided into hazardous, special waste and so on.

RADIOACTIVE WASTE MANAGEMENT

The main principle on which the management of radioactive waste is based is its collection and subsequent isolation from the surrounding environment (concentrate and retain) for the time necessary to allow the decay of radioactivity levels until they are no longer dangerous for the human health and the environment protection.

Sogin safely manages the radioactive waste both resulted from previous operations and decommissioning of nuclear power plants. In each power plant, waste is characterised, treated, conditioned and stored in interim storage facilities before being transferred to the National Repository.

After the gradual transfer of radioactive waste to the National Repository, the interim storage facilities will be dismantled. The subsidiary company Nucleco daily collects and manages radioactive waste resulting from nuclear medicine, industrial and research activities.

The radioactive waste management includes several activities: characterisation, treatment, conditioning, storage, disposal.

Characterisation – the characterisation procedure entails a series of analysis and measurements to identify the waste chemical, physical and radiological features. This activity is performed at different stages of the radioactive waste management process:

- At an initial stage, to define treatment and conditioning procedures;
- At an interim stage, to monitor the progress of the process;
- At a final stage, to verify the appropriateness of the treatment and conditioning operations performed on the waste.

RADIOACTIVE WASTE CLASSIFICATION AND INVENTORY

There are several categories of radioactive waste, which correspond to different management procedures, depending on the concentration of radionuclides and the period of radioactivity decay.

Radioactive waste in Italy is classified under the ministerial decree of 7 August 2015 which divides it into 5 categories according to its radioactivity content (short-lived waste, very low-level waste, low level waste, intermediate level waste, high level waste) and its specific disposal solution.

Treatment – At this stage, the radioactive waste undergoes specific operations to alter its physical shape and/or chemical composition. The aim of these operations is to reduce the waste volume or to prepare it for the next conditioning stage. The kind of treatment to be implemented depends of the waste features: physical and geometrical form, kind of material, radiological and chemical content.

Conditioning – after treatment, the conditioning process involves the creation of a final product (conditioned radioactive waste + container) ready to be moved, stored in the interim storage facility and lastly transferred to the National Repository. This product is chemically and physically stable and its structural resistance allows the isolation of radionuclides. Conditioning generally involves a cementation process, through technologically advanced cementitious materials according to the type of waste. Conditioning processes, in fact, may vary based on the waste chemical and radiological features.

Storage - After treatment and conditioning, the waste is stored in specific interim storage facilities before its radiological content decays to lower levels, until it is ready to be disposed of in the most appropriate way.

Disposal – The final stage of radioactive waste management, in which the radioactive waste is sent to a storage facility to be disposed of. The final destination (surface or underground storage facilities) depends on waste radioactivity level.

Radioactive waste resulted from the plants' previous operations, safe maintenance activities and dismantling operations is safely stored by Sogin Group in specific interim storage facilities located in each site, to be later sent to the National Repository. The inventory of Sogin radioactive waste at 31 December 2018 is reported below.

From this year on the inventory also includes data related to Cemerad - the site assigned to Sogin for remediation procedures started in 2017.

Sogin inventory of radioactive waste at 31.12.2018 ¹⁹

Classification of the Ministerial Decree 7 August 2015

Unit of measurement: cubic metres

	Short-lived radioactive waste		Very low-level waste		Low level waste		Intermediate level waste		High level waste		Total		Ref.
	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	
Caorso	0	0	781	744	1,584	1,702	0	0	0	0	2,365	2,446	
Final products	0	0	103	521	8	37	0	0	0	0	111	558	1
To be treated	0	0	678	223	1,576	1,665	0	0	0	0	2,254	1,888	
Garigliano	0	0	1,583	1,600	1,292	1,207	90	90	0	0	2,965	2,897	
Final products	0	0	55	854	923	1,064	90	90	0	0	1,068	2,008	2
To be treated	0	0	1,528	746	369	143	0	0	0	0	1,897	889	
Latina	0	0	852	887	483	821	421	31	0	0	1,756	1,739	
Final products	0	0	18	359	1	90	89	0	0	0	108	449	3
To be treated	0	0	834	528	482	731	332	31	0	0	1,648	1,290	
Trino	0	0	764	692	275	250	72	70	0	0	1,111	1,012	
Final products	0	0	255	572	156	209	8	8	0	0	419	789	4
To be treated	0	0	509	120	119	41	64	62	0	0	692	223	
Bosco Marengo	0	0	120	31	309	330	1	1	0	0	430	362	
Final products	0	0	99	31	297	225	0	0	0	0	396	256	5
To be treated	0	0	21	0	12	105	1	1	0	0	34	106	
Casaccia	0	0	0	0	3	3	186	174	0	0	189	177	
Final products	0	0	0	0	0	0	0	0	0	0	0	0	6
To be treated	0	0	0	0	3	3	186	174	0	0	189	177	
Saluggia	0	0	1408	1363	958	831	552	516	0	0	2,918	2,710	
Final products	0	0	248	229	67	63	34	34	0	0	349	326	7
To be treated	0	0	1,160	1,134	891	768	518	482	0	0	2,569	2,384	
Rotondella	0	0	2,709	2,645	285	284	220	220	0	0	3,214	3,149	
Final products	0	0	869	861	220	224	163	163	0	0	1,252	1,248	8
To be treated	0	0	1,840	1,784	65	60	57	57	0	0	1,962	1,901	
Cemerad	665	781	71	114	112	112	0	0	0	0	848	1,007	
Final products	0	0	0	0	0	0	0	0	0	0	0	0	9
To be treated	665	781	71	114	112	112	0	0	0	0	848	1,007	
Total	665	781	8,288	8,076	5,301	5,540	1,542	1,102	0	0	15,796	15,499	
Final products	0	0	1,647	3,427	1,672	1,912	384	295	0	0	3,703	5,634	
To be treated	665	781	6,641	4,649	3,629	3,628	1,158	807	0	0	12,093	9,865	

References:

- 1) CAORSO: changes due to the production of technological waste, debris and waste resulted from cutting operations on very low-level waste, from the production of casks containing resins and the transfer of sludge and resin tanks and casks outside of the site for treatment.
- 2) GARIGLIANO: changes due to the production of waste resulting from super-compaction, casks containing debris and soil and new storage of solid waste (iron, rubber, plastic, technological waste) in iso-containers.
- 3) LATINA: changes due to the production of low level and very low-level waste containing soil, cementitious debris, metal and technologic waste and the new radiological characterisation of previous waste following the update of the correlation factors.
- 4) TRINO: changes due to the transfer of waste to Nucleco for super-compaction treatment of new campaigns, return of the overpacks resulting from the super-compaction and repackaging campaigns performed on previous waste.
- 5) BOSCO MARENGO: changes due to the production of very low-level and low level conditioned waste resulting from Nucleco treatments, decommissioning operations and the shipment of low level and very low-level waste to Nucleco for treatment.
- 6) CASACCIA: changes due to the production of solid waste resulting from the operations.
- 7) SALUGGIA: Changes due to the production of conditioned low level and very low-level waste resulted from treatment at Nucleco, from increased volume of low level and very low-level waste due to decommissioning, treatment and repackaging activities of waste stored in containers and increase in the volume of intermediate-level waste due to the repackaging in metallic containers for dismantling IFEC.
- 8) ROTONDELLA: changes due to the production of very low-level conditioned technological waste and to the production of low and very low-level waste (sludges of the underground water treatment facility, soil, technological waste from Corridor remediation and cementitious waste from works of Pit 7.1).
- 9) CEMERAD (not included in the previous Sustainability Report): Changes, from 2017, due to the shipment of radioactive waste to external facilities.

¹⁹ From 2017 Sustainability Report, a change in terminology was made, the term “non-conditioned” was replaced with “to be treated” and the term “conditioned” with “final products” namely, ready to be shipped to the National Repository. This change led to consider some of the waste listed in the Inventory of 2017 Sustainability Report, and especially very low-level waste, as “final products”, ready to be transferred to the National Repository without further conditioning in cementitious matrix; however, according to recent ISIN’s guidelines, this waste should still undergo further treatment to ensure the waste blanketing; for this reason, this waste has been reported among the waste “to be treated” listed in this inventory.

Below the inventory of Nucleco radioactive waste is reported, which is also included in the SIRR database of Ispra. This waste comes from the operations and decommissioning procedures of Sogin site in Casaccia and from industrial, research and medical and health activities. After being treated and conditioned, the waste becomes the property of ENEA, according to the guidelines of the integrated service. The Integrated Service was established on the initiative of ENEA, following the CIPE resolution of 1 March 1985, aiming

at centralising the management of medical, industrial and research waste produced in the Country. ENEA is responsible for the service and for the waste management procedure when the waste is delivered to the Service from the Operators. The waste produced by Sogin and managed by Nucleco, return to its origin sites after treatment and conditioning. Exception is made for the waste produced in Sogin-Casaccia site that are stored in Nucleco storage facilities, although it is still owned by Sogin.

Radioactive waste stored in Casaccia and managed by Nucleco at 31.12.2018

Classification under the Ministerial Decree of 7 August 2015

Unit of measurement: cubic metres

	Short-lived waste	Very low-level waste	Low level	Intermediate level	High level	Total
Conditioned	0	1,977	1,801	320	0	4,098
Non-conditioned	440	1,142	2,017	351	0	3,950
Transited	0	1.53	71	0	0	224
Total	440	3,272	3,889	671	0	8,272

CONVENTIONAL WASTE MANAGEMENT

The decommissioning of nuclear plants produces both radioactive and conventional waste: the latter is classified according to an EWC (European Waste Code) which enables a stabilization of management and transfer processes to licensed bodies, by prioritizing waste recovery and final disposal, when it cannot be reused.

In this matter, Sogin works, from the initial design stages of its production processes, to minimise the production of waste intended for disposal and to maximize the share of waste to be sent for recovery. The Company ensures the traceability of all waste, from dismantling or demolition operations to the recovery or disposal facility.

NATIONAL REPOSITORY AND TECHNOLOGICAL PARK

The National Repository is an environmental surface facility intended for the safe storage of the Italian radioactive waste. The creation of the National Repository will allow completing the decommissioning of Italian nuclear power plants and radioactive waste management, including the waste resulted from nuclear medicine, industrial and research activities: it will, thus, support the closing of the Italian nuclear cycle. The siting, design, implementation and management of the facility are entrusted to Sogin, as under the Legislative Decree No. 31/2010.

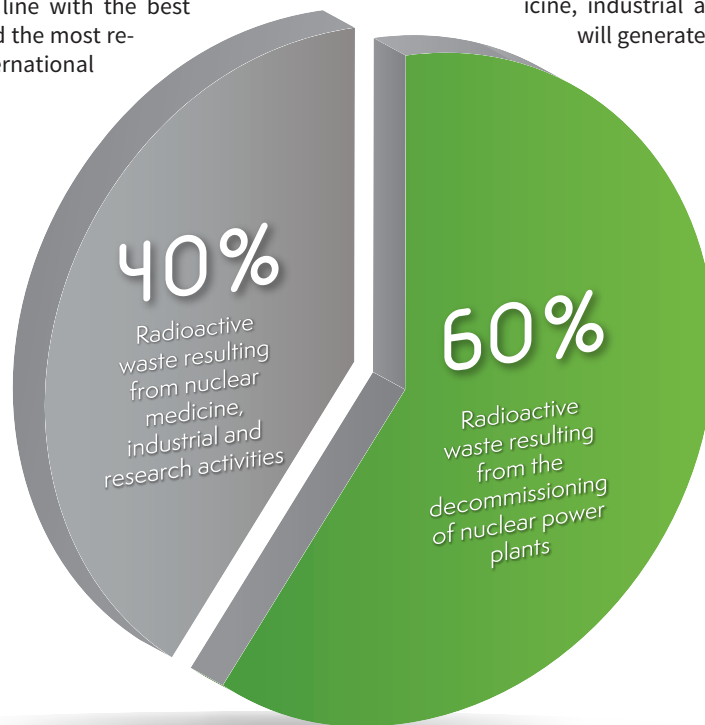
The Repository will enable the final arrangement (disposal) of very low and low-level waste for an estimated volume of about 78,000 cubic metres, as well as the interim arrangement (storage) of intermediate and high-level waste for a volume of about 17,000 cubic metres, before its transfer, for disposal, to a geological repository.

The National Repository will consist of a structure with engineering and natural barriers, arranged to contain radioactivity, and designed in line with the best international practices and the most recent IAEA standards (International Atomic Energy Agency).

The transfer of radioactive waste to a single structure will ensure its safe, efficient and logic management, and will enable completing the decommissioning of nuclear power plants, thus, releasing the sites without radiological restrictions. The implementation of the National Repository will also allow to comply with European Directives, thus resulting into a better alignment of Italy to other Countries presenting similar repositories.

Along with the National Repository, a Technological Park will be implemented, which will house an applied research centre, open to international collaboration in the fields of decommissioning, radioactive waste management, radioprotection and environmental protection, which may be in line with local necessities and communities, according to the area in which the facility will be built.

60% of the about 95,000 cubic metres of radioactive waste, will result from the nuclear plants' dismantling operations, while the remaining 40% will result from nuclear medicine, industrial and research activities that will generate further waste in the future.



The National Repository and Technological Park will occupy an area of about 150 hectares, 110 of which will be occupied by the Repository and 40 to the Park. Within the 110 hectares of the Repository, 20 will house facilities for the final storage of low and very low-level waste, about 10 hectares will be dedicated to the interim storage facilities of intermediate and high level waste, the remaining 80 hectares will be occupied by auxiliary plants and buffer zones.

For the first time in Italy, the siting of a big work is based, by law, on a process that involves the territories concerned. The Legislative Decree No. 31/2010 provides for a public consultation aimed at identifying the area that will house the Repository through a structured engagement of stakeholders.

Sogin has launched information, transparency and engagement activities in line with the siting procedures provided for in the Legislative Decree No. 31/2010. These are preliminary activities to the public consultation, which will start upon reception of the ministerial authorisation.

deposito nazionale

Scriviamo insieme un futuro più sicuro

95,000

CUBIC METRES OF RADIOACTIVE WASTE

4

YEARS OF WORK

700

PEOPLE EMPLOYED IN THE OPERATIONS

28

SITING CRITERIA ESTABLISHED BY ISPRA

13

ELABORATION CRITERIA

15

EXCLUSION CRITERIA

2,000

PEOPLE YEARLY EMPLOYED IN THE CONSTRUCTION

1.5

BILLION OF INVESTMENT

40

OPERATION YEARS

300

PAPERS TO BE PUBLISHED FOR THE PUBLIC CONSULTATION

150

SURFACE HECTARES

80

HECTARES FOR AUXILIARY PLANTS AND BUFFER ZONES

20

HECTARES FOR THE DISPOSAL STORAGE FACILITY

4

MONTHS OF PUBLIC CONSULTATION

10

HECTARES FOR THE STORAGE

40

HECTARES FOR THE TECHNOLOGICAL PARK

Stage	Activities under Legislative Decree No. 31/2010	Information, transparency and engagement activities
Siting criteria	<p>4 June 2014 – launch of the siting process of the facility with the publication of technical guide No. 29 on behalf of Ispra containing the siting criteria needed to Sogin to draft the proposal of National Charter of Potentially Suitable Areas (CNAPI) to house the facility.</p>	<ul style="list-style-type: none"> • Opinion survey on the perception of the need of the radioactive waste National Repository • Launch of a Forum for the closing of the nuclear cycle • Creation of a scientific board to examine the technical issues connected to the implementation of the facility • National and international conferences on decommissioning and radioactive waste management. Participation to Ecomondo and the annual ANCI assembly • Visits to foreign repositories (France and Spain)
Submission of the CNAPI proposal	<p>2 January 2015 - Sogin submits the CNAPI proposal to Ispra.</p> <p>July 2015 – the Ministry for Economic Development and the Ministry for the Environment and the Protection of Land and Sea officially receive the CNAPI proposal from Ispra, which includes the technical reports requested by the Ministries.</p> <p>21 July 2015 – The Ministry for Economic Development and the Ministry for the Environment and the Protection of Land and Sea state that the authorisation would be issued within the legal deadlines.</p> <p>In several parliamentary hearings between September 2016 and the first half of 2017, the Ministries for Economic Development and Environment state that the authorisation would be issued upon approval of the national programme for the management of radioactive waste and spent fuel.²⁰</p> <p>During 2018, the National Repository and Technological Park (NRTP) continued monitoring the databases of the territorial features identified for the application of the siting criteria, for the implementation of the CNAPI proposal and for its following updates.</p> <p>In January 2018, Sogin submitted the latest updated version (31/12/2017) of the CNAPI proposal to Ispra, in May 2018, CNAPI was further updated following the issue of the new DISS (Database of Individual Seismogenic Sources) database on behalf of INGV, and on 31/12/2018 the periodic programmed database verification was completed.</p> <p>Technical and designing features of the National Repository were also maintained.</p> <p>Update activities on the inventory estimates and the development of a safety analysis for the NRTP, in all its lifecycle, were also implemented.</p>	<ul style="list-style-type: none"> • Opinion survey on the perception of the need of the radioactive waste National Repository • Centre for the closing of the nuclear cycle • Activities of the scientific Board • National and international conferences on decommissioning and radioactive waste management. Participation to Ecomondo and the ANCI assembly. • Visits to foreign repositories (France and Spain) • Web information campaign “Let’s write a safer future” • Participation to national events, addressed to the stakeholders, to explain the project • Launch of the website depositonazionale.it • Open Gate • Launch of the national information campaign • Stakeholder engagement activities • Open ideas competition

²⁰ By Legislative Decree No. 45/2014, Italy implemented the 2011/70/EURATOM Directive which requires EU Member States to define a national programme for the management of spent fuel and radioactive waste.

PUBLIC CONSULTATION AND EXPRESSIONS OF INTEREST

Upon issue of the authorisation on behalf of the Ministries for Economic Development and Environment, Sogin will publish the National Charter of Potentially Suitable Areas, the preliminary project of the National Repository and Technological Park along with 300 technical reports of the project on the website *deposizionazionale.it*.

After publication the public consultation will start, this is the first time in Italy in which people are called to decide on a relevant national facility to choose together the siting of the National Repository.

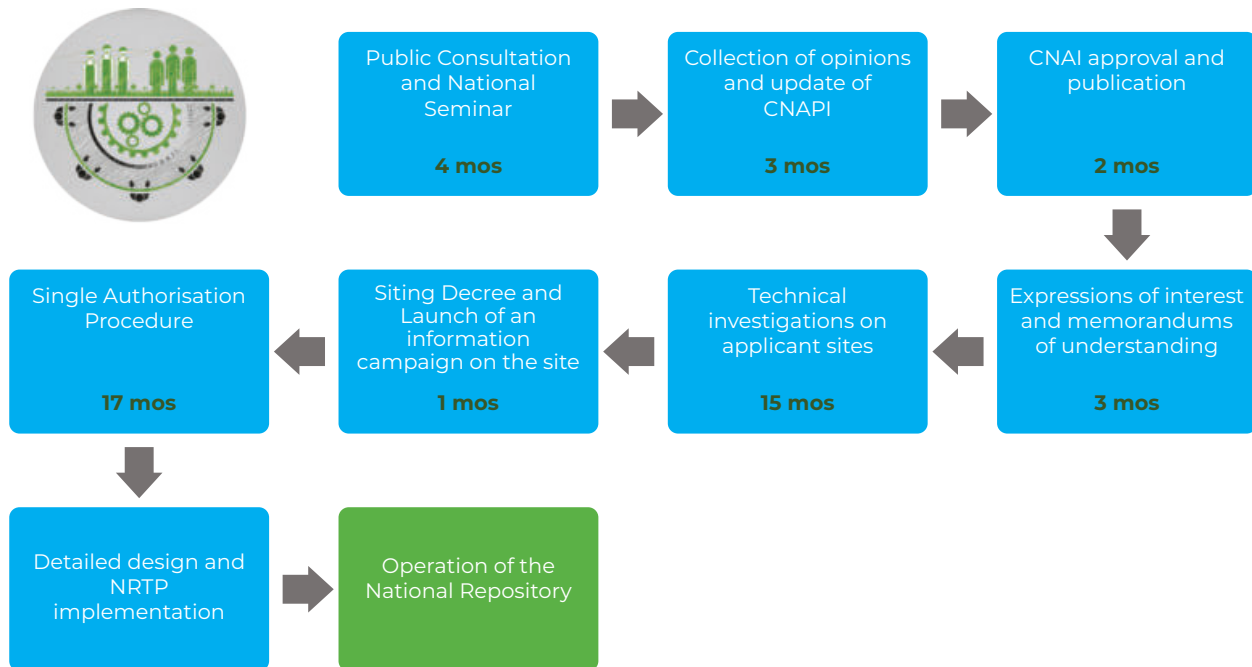
At this stage, lasting 4 months, everybody - citizens, businesses, associations, national and local institutions, universities, etc. - will have the chance to share opinions and technical proposals through the website *deposizionazionale.it* or to attend Sogin events in concerned areas and the

National Seminar provided for by Law. Art. 27, paragraph 4, of Legislative Decree No. 31 of 2010, provides that, at the end of the 4 months, Sogin promotes a National Seminar which will engage all concerned stakeholders, both institutional and others.

At the end of the consultation, Sogin will update the CNAPI that will become the National Charter of Suitable Areas after the validation of ISIN (Nuclear Power Safety Inspectorate) and the approval of the Ministries for Economic Development, Environment and Infrastructures. Finally, Sogin will ask the Regions and local entities involved in the new Charter to submit their, voluntary and non-binding, expressions of interest to carry out the needed on-site investigations.

Sogin was entrusted by law to site the National Repository in agreement with territories and Regions.

SITING PROCEDURES FOR THE NATIONAL REPOSITORY



ESTIMATE OF RADIOACTIVE WASTE FOR THE NATIONAL REPOSITORY

The total amount of radioactive waste to be transferred to the National Repository includes the waste resulted from the previous operations carried out in the national territory (existing waste) and the waste that will result from the decommissioning of Italian nuclear facilities, including medical, industrial and research facilities.

Sogin has developed the inventory estimate of radioactive waste to be transferred to the National Repository by means of the classification provided for in the ministerial decree of 7 August 2015. This estimate reports the quantities in volume of previously produced and conditioned waste, of produced and non-treated waste and of the waste that will result from future operations; this waste is divided according to:

- Final destination, depending on whether it is transferred to the National Repository for disposal (very low-level and low-level waste) or for temporary storage purposes (intermediate and high-level waste);
- Sector of origin, distinguishing between energy and non-energy waste. Energy waste results from the operations and decommissioning of the nuclear power cycle plants, while non-energy waste results from research, medicine and industrial sectors;

- Production time, distinguishing between previous and future waste. Previous waste can be conditioned or still to be treated; future waste, instead, will result from the decommissioning of nuclear power plants and from medical, industrial and research activities.

The National Repository will house approx. 95,000 cubic metres of radioactive waste. 78,000 cubic metres of this quantity consists of very low-level and low-level radioactive waste intended for disposal. The remaining 17,000 cubic metres are intermediate and high-level waste which will be temporarily stored in a geological repository before its disposal. A small percentage of this waste, 400 cubic metres, consists of non-processable fuel and waste generated by the fuel reprocessed abroad. The inventory estimate is periodically updated according to possible changes in several factors such as the production trend of waste from nuclear medicine and research facilities, and the decommissioning strategies adopted by nuclear power plants as well as the radioactive waste treatment and conditioning strategies implemented.

VOLUME ESTIMATE OF RADIOACTIVE WASTE TO BE TRANSFERRED TO THE NATIONAL REPOSITORY

Estimate as of 31.12.2015

DISPOSAL REPOSITORY		STORAGE REPOSITORY		
☆ VERY LOW-LEVEL WASTE	☆ LOW-LEVEL WASTE	☆ INTERMEDIATE-LEVEL WASTE*	☆ HIGH-LEVEL WASTE (VITRIFIED WASTE AND IRRADIATED FUEL)	
m ³		cask		
SOGIN	INTERNAL AND VESSEL (NUCLEAR PLANTS)	430	VITRIFIED WASTE (UK)	4
	GRAPHITE (LATINA)	3,990	VITRIFIED WASTE (FRANCE)	3
	COMPACTED WASTE (10 CASKS FROM FRANCE)	390	ELK RIVER FUEL (TRISAIA)	2
	CEMENTED LIQUIDS (CEMEX, ICPF ETC.)	1,110	OTHER SOGIN FUEL (AVOGADRO)	1
	OTHER	3,420	FUEL ELEMENT PARTS (CASACCIA)	5
	24,300 m³	25,900 m³	9,340 m³	15 casks (370 m³)
m ³		cask		
OTHER	RESEARCH (CCR, AVOGADRO, CESNEF, LENA)	3,880	RESEARCH FUEL (CCR)	3
	MEDICINE/INDUSTRY (NUCLECO, CAMPOVERDE, PROTEX, LIVANOVA)	3,780	RESEARCH FUEL (ENEA/TRIGA)	1
	↳ SOURCES	3,480		
	↳ OTHER	300		
	6,500 m³	21,100 m³	7,660 m³	4 casks (30 m³)
30,800 m³	47,000 m³	17,000 m³	400 m³	

* As provided for in the Ministerial Decree No. 7/8/2015 a share of intermediate-level waste may be transferred to the DN Disposal Repository, according to the outcomes of the safety analysis that will be carried out after the National Repository has been sited

BENEFITS FOR THE TERRITORY

The implementation of the National Repository and Technological Park will result in direct and indirect benefits for the local communities that will host it, including not only compensatory measures for the long-term occupation of a piece of land, but also employment, economic, social and cultural development.

Investments will be allocated and defined in agreement with local communities and in line with the territorial needs.

The public consultation will give the chance to institutions and locals to suggest possible changes in the design of the National Repository, to orientate the research areas of the Technological Park and to agree the disbursement and allocation of the economic benefits to the territory. The purpose of these benefits is to better integrate the facility with the territorial features of the area that will house it, as in

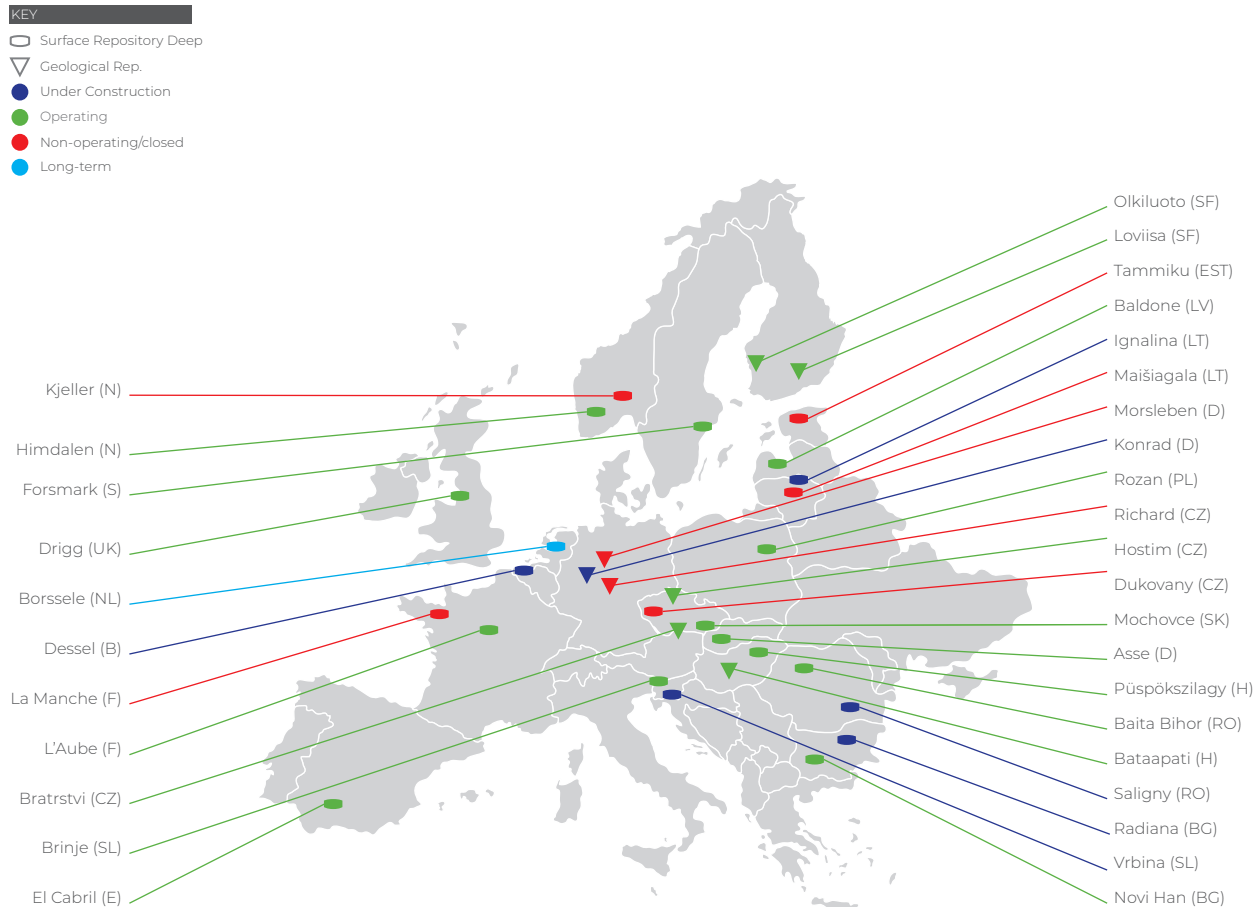
every other EU Country, by including social, environmental and economic aspects, and in line with the local productive fabric.

Further details on the National Repository and Technological Park design are available at deposizionazionale.it.

Currently, the European most industrialised countries have developed a centralised management system for their nuclear waste. Even Norway, in which nuclear power was never used, houses repositories for low and intermediate-level waste.

However, today, none of the European repositories has a Technological Park, as provided for in the Italian project, for research and development activities to promote the integration of the facility with the surrounding area.

MAP OF EUROPEAN REPOSITORIES

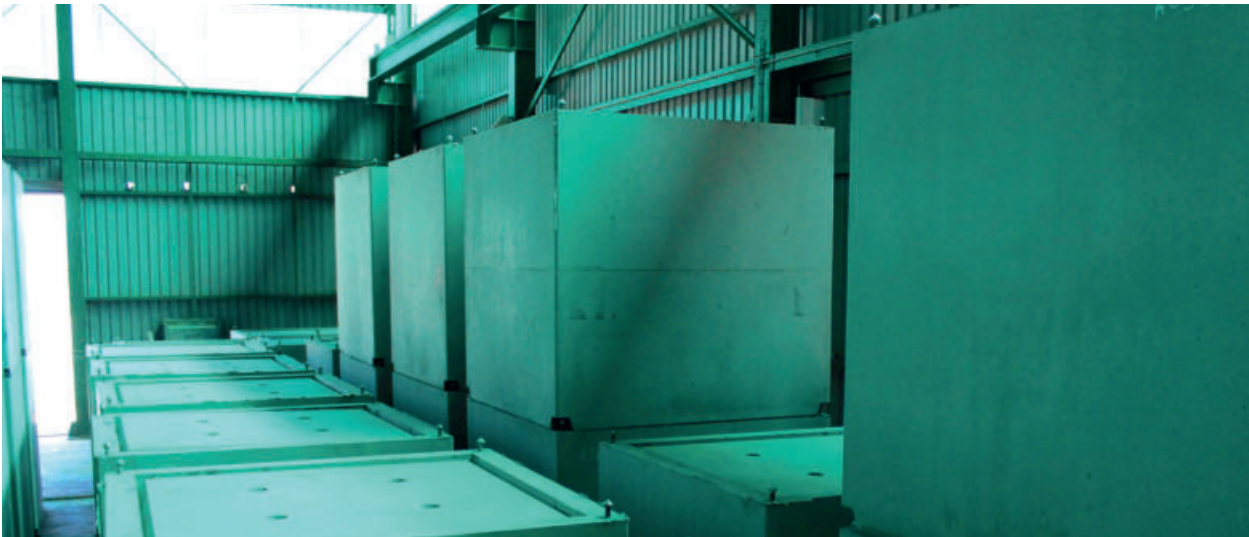




L'Aube Repository (France)



Borssele long term interim storage (Netherlands)



El Cabril Repository (Spain)

IAEA PEER REVIEW

The Italian nuclear decommissioning requires a complex design, since dismantling activities should be simultaneously performed on different nuclear sites and they require adopting specific technological solutions, often prototype, which cannot be used in different plants.

To guarantee the best efficiency and efficacy standards, Sogin promotes a continuous exchange with the best international standards in the field, especially the International Atomic Energy Agency (IAEA) of the United Nations.

In 2017, the Agency has developed a peer review upon request of the Italian government, on the overall decommissioning programme of Italian nuclear power plants. The peer review - Integrated Review Service for Radioactive Waste and Spent Fuel Management Decommissioning and Remediation -, prepared within the ARTEMIS project, aimed at assessing the consistency of times and costs, evaluating the adopted strategies and the improvement opportunities.

This was the first Peer Review performed by the IAEA on the whole decommissioning programme of a Country.

In the final report, experts from the Agency have underlined the “solid” approach of Sogin deactivation programmes, in line with the best international practices, and the continuous commitment in ensuring the safe maintenance of the sites by means of a highly qualified staff and a proper technological know-how.

The coordination with the Agency has continued in 2018 with a Technical Review on projects of technical and strategic nature for the implementation of the decommissioning programme: the dismantling of reactors (vessels and internals) in Trino and Garigliano nuclear plants. The IAEA team of experts, coming from France, Germany, Russia and US, visited the sites from 24 to 29 June 2018. Their final report confirmed that Sogin has solid skills and structures to carry out decommissioning operations.

PROJECT MANAGEMENT

As for the project management, starting from 2016, Sogin has developed the PPDI® - Physical Progress Decommissioning Indicator. This is a system created for the management of nuclear decommissioning projects and consisting of a set of indicators to assess strategic, operative and control processes. In 2018, the PPDI® trademark was registered and several operations were launched that include: the implementation of the Project Risk Management tool and the Detailed Time Plans through the release and test of the new project risk controlling system.

Training courses for task managers and PMOs, have been also provided for the implementation of the new tools. The Project Risk Management tool was developed also in the "Uncertainties management" modality.

In 2018, a set of interventions to improve IT systems was also launched.

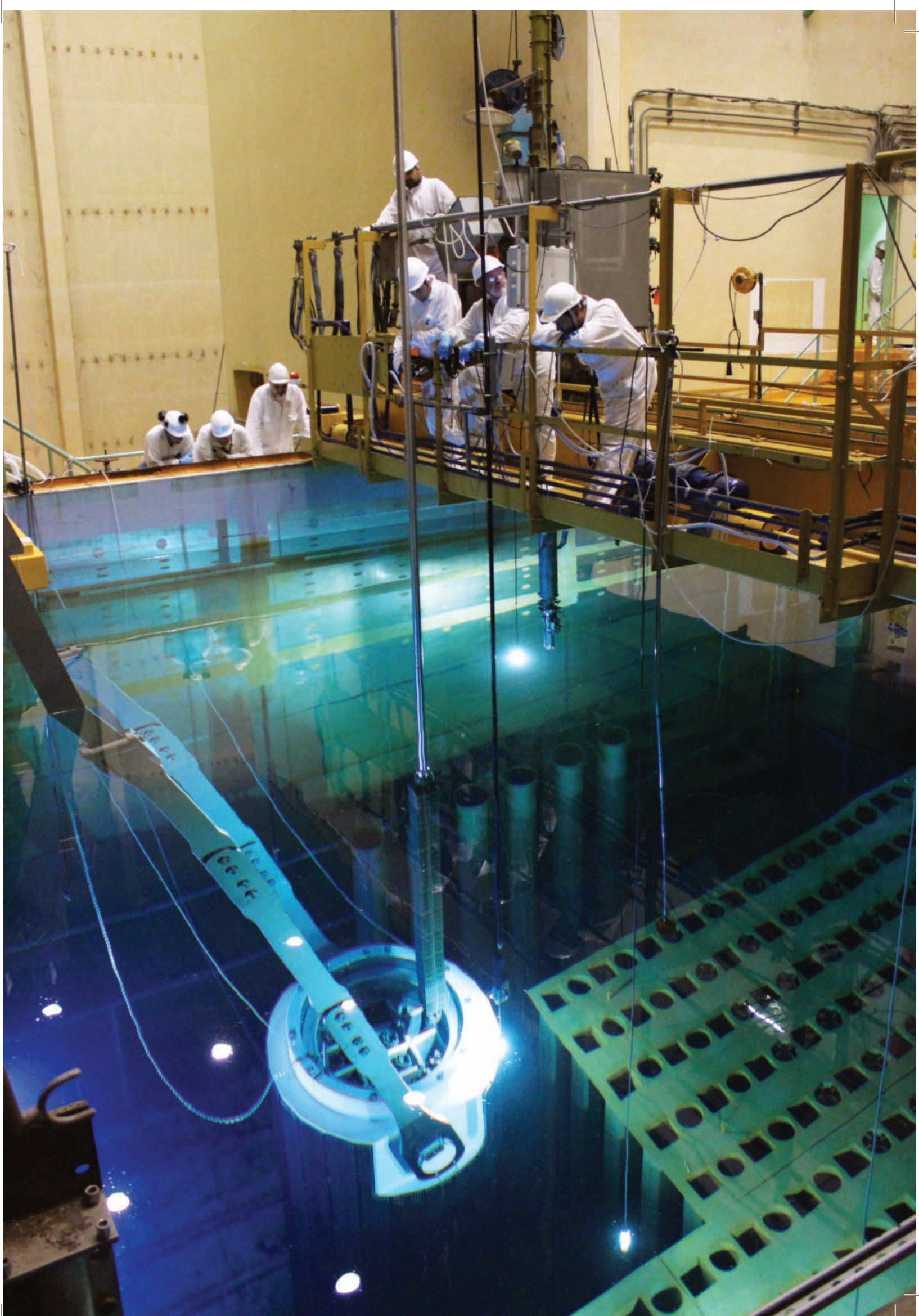
The action guidelines involve supporting systems for corporate processes, such as:

- The implementation of an IT solution for the centralised management of the **job accounting**, that may be used on-field;
- Migration of the **data network to optical fiber** for the new data network;
- Operation of the new portal for tenders and supplier qualification under art. 58 of the Legislative Decree No. 50/2016 and subsequent amendments and integrations;
- Operation of the software for the management of **international investments**;

- Testing of the project to **computerise the management process of corporate assets**;
- Improvement of the **Disaster Recovery** facility in Latina site;
- Preparation of a solution based on the **AI Technology** for the estimation process;
- Launch of a study for the implementation of the waste management tool to be integrated with **DLT/Blockchain** technologies.

The platform was presented on several occasions, among which the International Workshop on Application of Advanced Plant Information Systems for Nuclear Decommissioning and Life-cycle Management, organised by IFE, AEN, IAEA, EPRI, NKS; to the DCEG (Decommissioning Cost Estimation Group) at OCSE/AEN, in the Primavera Day of Oracle; at the Politecnico di Milano; in a meeting with a delegation from the Nuclear Decommissioning Research Center of Hanyang University - Korea.

As far as the project verification is concerned, on 19 April 2018 Sogin was accredited inspection body of type B according to the UNI CEI EN ISO/IEC 17020 regulation, thus showing its competencies and ability to align with the most advanced international and national standards, and by confirming the quality of its project verification processes.



3

NATIONAL AND FOREIGN MARKET OPERATIONS

MARKET OPERATIONS

MARKET OPERATIONS IN ITALY

Due to its expertise in the field of decommissioning and radioactive waste management, Sogin Group has been successfully working in the national market. The main projects launched, implemented and completed in 2018 are listed below.

Remediation of Cemerad Repository and management of radioactive waste (Taranto)

The Cemerad Repository in Statte (TA) used to collect and store solid and liquid radioactive waste resulted from medical, industrial and research activities.

Sogin works in concert with the special Commissioner for the implementation of the safe maintenance and management of the hazardous radioactive waste stored in Cemerad.

Notably, between 2016 and 2017, Sogin signed two partnership agreements with the special Commissioner, appointed in 2015, with which the Company commits to:

- Providing technical and professional support to carry out the waste clearance within the repository and the radiological remediation of the site;
- Designing and implementing planned remediation interventions, with the support of Nucleco.

The strategy outlined by Sogin aims at implementing the safe maintenance of the about 16,500 stored radioactive casks and the site release, including existing installations, without radiological restrictions. The operations are divided into four main stages: preliminary works and opening of the working site; cask removal and clearance; waste characterisation and management; final remediation of the site and following release without radiological restrictions. All operations are carried out by Sogin and Nucleco, in line with the highest standards of safety for workers, people and environment.

Waste clearance activities continued in 2018, with the removal of casks containing radioactive material, initially launched in 2017. About 2,300 casks have been transferred with nine shippings. Clearance of the site is expected to be completed by 2019. Moreover, in 2018, the agreement with the operators of the integrated service was ratified to implement the radiological characterisation, treatment and disposal of potentially decayed waste.

Conversion of the “Galilei” reactor of GENIODIFE/CISAM (Pisa) into an interim storage facility

In July 2018, the management of Works of the Ministry of Defence (GENIODIFE) awarded to Sogin the contract for the preparation of a feasibility study for the conversion of the nuclear reactor RTS-1 “Galilei”, located in the Study Centre for Military Applications (CISAM) in Pisa, into an interim storage facility for intermediate and low-level waste.

The study included a technical and engineering analysis of the civil works of the nuclear reactor RTS-1, especially in relation to the seismic activity of the territory, to evaluate the chance of using the structure as an interim storage facility for radioactive sources and waste generated by military installations. In addition to this, the study also focussed on alternatives, such as the implementation of a new repository and the optimisation of the existing repository.

The project was concluded in time: on 30 November the final version of the feasibility study was submitted to GENIODIFE and on 5 December, a final meeting between Sogin and GENIODIFE was organised to present the results and opportunities of a potential future cooperation.

Dismantling of the primary circuit of the research reactor “Galilei” of the CISAM (Pisa)

In December 2014, Sogin Group, through the subsidiary Nucleco, established a contract for the dismantling operations of the primary circuit and auxiliary systems of the research reactor “Galilei” of CISAM (Study Center for Military Applications) in Pisa.

Sogin activities have involved a radiological mapping for decommissioning operations, conditioning of radioactive waste through cementation and following post-characterisation operations.

The contract also included the professional services of a third-level qualified expert. This service ended in 2018 and involved:

- The physical monitoring of radioprotection under the Legislative Decree No. 230/95 and following amendments and integrations;
- Activities for the clearance of releasable materials;
- The declassification of working sites;
- Reporting activities.

Radiological remediation of the Shooting Range “Punta della Contessa” (Brindisi)

In 2017, Sogin Group, through the subsidiary Nucleco, was awarded a contract with the NATO Support Procurement Agency (NSPA) for the radiological and environmental remediation of the Shooting Range “Punta della contessa” in Brindisi. The operations include the implementation of conventional and radiological surveys to detect unexploded ordnances, the demolition of buildings, asbestos removal, and, finally, the management, collection, transfer, recycling and disposal of stored waste. The areas subject to remediation are located in a site of national interest on a surface of 6 hectares facing the sea.



FOREIGN MARKET OPERATIONS

Sogin Group, with its foreign subsidiaries in Moscow and Bratislava, shares its know-how with third parties at an international level, by providing a range of services such as: project management, radiological characterisation and radioactive waste management. The main projects launched, implemented and completed in 2018 are listed below.

Framework Agreement for the supply of services in the JRC-LMR of Ispra (Varese)

In 2014, Sogin Group, through the subsidiary Nucleco, was awarded a four-year contract with subsequent eight-year renewal for supporting the laboratory staff in measuring radioactive and potentially radioactive samples and performing chemical, radiochemical and radiometric analyses and on-site measurements.

Technical assistance for decommissioning and radioactive waste management in the JRC/UE of Ispra (Varese)

In 2018, Sogin supplied the Joint Research Center (JRC) of the European Commission with highly qualified services in the field of decommissioning and radioactive waste management. Sogin has, especially, conducted a study on the reorganisation of the Ispra (VA) site security and logistics, the technical review of the nuclear plants' licensing documents and the preparation of documents for the characterisation of treatment facility for liquid radioactive waste. The activity was implemented within the scope of the framework agreement ratified with the JRC/European Commission for the supply of a supporting service for the implementation of a decommissioning and waste management programme of Ispra (D&WM PIA Service), awarded to the Company in 2017 following a tender procedure.

Consulting service on the decommissioning of the V1 reactor in Bohunice (Slovakia) nuclear plant

The project, awarded to Sogin following an international tender procedure, envisages the supply of management and technical consulting services to the State-owned Slovakian Company JAVYS (Jadrová A Vyráďovacia Spoločnosť) for the dismantling of the V1 facility of the nuclear power plant of Bohunice, equipped with 2 pressurized reactors VVER 440-230. Sogin is especially supporting JAVYS in managing the dismantling operations of the plant. In addition to project management, support during the procurement stage, engineering and specialised studies, Sogin also supports the Slovakian Company in monitoring the progress of ongoing projects.

In 2018, Sogin continued its technical consulting especially in stage 2, concerning the removal and clearance of systems and plant parts and the demolition of existing structures, in line with the dismantling programme. During the same year, Sogin issued the technical study for the final decommissioning of the plant, which includes dismantling, decontamination, demolition and restoring activities of the site up to the brown field. Meanwhile, consulting services were supplied for the monitoring of ongoing activities for the implementation of the peer review, the critical planning analysis and the time programme provided for in the dismantling of the V1 facility. Sogin consulting services to JAVYS were reconfirmed for 2019.

“Feasibility study on nuclear sunken objects in the Arctic Sea” for the European Commission (Russia)

At the request of the General Directorate of the International and Development Cooperation (Stability, Security, Development and Nuclear Safety) of the European Commission, Sogin leads an international group of companies (German, English, Norwegian) to carry out a study that will detect, according to the figures provided by Rosatom, the hazardous nuclear sunken objects in the Arctic Sea of Russian origin (nuclear submarines, nuclear reactors, etc.) and to draft and propose a project for their recovery, based on a feasibility study. The main activities of the project, launched in 2017 and continued in 2018, include the development of an inventory of the objects sunken in the Barents and Kara seas, the classification of sunken objects and the feasibility study for their recovery, management and safe maintenance. After the development of an inventory, classification and listing of the sunken objects according to their hazardousness for the people and the environment, in 2018, a range of possible scenarios for the release of radioactive materials have been drafted for the six most dangerous sunken objects. Each of the identified scenarios for radioactive elements was characterised as a radioactive source at sea and on land, which was subsequently used to assess their impact on the environment and the population.

Technical Assistance to the Norwegian Radiation and Nuclear Safety Authority (Norway)

In 2015, Sogin Group was awarded by the Norwegian Radiation Protection Authority (NRPA) a framework contract covering nuclear and radiological technical assistance to the Norwegian Radiation and Nuclear Safety Authority (DSA), which also includes a support activity for the definition of a Joint Threat Assessment on the illegal trafficking of CBRNe (Chemical, Biological, Radiological and Nuclear and explosive) materials, along the external border of the European Union between Slovakia and Ukraine. In this connection, in 2016-2017, Sogin offered its expertise in the field of physical protection of radioactive material and coordinated a team of international experts in the chemical and bacteriological fields.

Support activities for radiological characterisation at the JRC/ ITU of Karlsruhe (Germany)

In 2013, Sogin Group, through the subsidiary Nucleco, was awarded a four-year contract with subsequent renewal in 2018, for activities of radiological characterisation with gamma-ray spectroscopy and neutron coincidence counting at the Institute of transuranium elements of the JRC/ITU of Karlsruhe of the European Commission. The contract also includes the maintenance and calibration of measurement systems, the analysis of measurement results and the integration of data from different systems.

Technical assistance services in characterisation studies for the Belgian National Geological Repository (Belgium)

As part of the operations for the disposal of the waste managed by the Belgian National Agency for Radioactive Waste and Enriched Fissile Material (ONDRAF/NIRAS), in 2015, Sogin Group, through the subsidiary Nucleco, was awarded a contract to supply technical assistance services in the characterisation analysis and study for the management of radioactive waste to be transferred to the Belgian Geological Repository.

Collaboration with ANRA and NRSC (Armenia)

From 2016 to 2018, Sogin Group was engaged in supplying technical and management support to the Armenian Nuclear Regulatory Authority (ANRA) and to the Nuclear and Radiation Safety Centre (NRSC) for the management

of relevant documents also in terms of radioactive waste management.

The activity, ordered by the European Commission, has allowed to gain a specific expertise in providing strategic guidelines for a good practice in terms of plant security.

Consulting services for the Hanyang University on the decommissioning of fuel manufacturing plants (South Korea)

In 2018, Sogin was awarded a contract with the Hanyang University to transfer its know-how and good practices on Bosco Marengo decommissioning operations. The operations, ended in 2018, consisted in a transfer of knowledge on the dismantling strategies of a fuel manufacturing centre and an estimate of time and strategies applied for radioactive waste management. Sogin, has also introduced its new Project Management approach.

GLOBAL PARTNERSHIP

Within the scope of the Global Partnership programme (G8 of Kananaskis, Canada, 2002), on 5 November 2003 the Governments of the Italian Republic and the Russian Federation ratified a cooperation agreement for the dismantling of disused nuclear submarines of the Russian navy and in the field of radioactive waste and spent nuclear fuel safe management. This agreement was ratified by the Italian Parliament by Law No. 160 of 31 July 2005 and it can be considered one of the most successful collaborations in the field of disarmament and non-proliferation, both in terms of environmental protection and for the remediation of nuclear sites. The activities are managed by a Steering Committee made up of members of the Ministry for Economic Development and Rosatom.

Thanks to a specific Convention with the Ministry for Economic Development, ratified in 2005 and reconfirmed in 2008, Sogin was entrusted with the general coordination activity and management of administrative and operative aspects.

The activities already carried out and followed in 2018, are implemented in Arkangelsk (Zvyozdochka shipyards) and Murmansk (Nerpa shipyards, Gremika site and Adreeva Bay site). Moreover, according to the guidelines of the steering committee, Sogin has also carried out managing, monitoring and control activities on active contracts, and preliminary activities for the implementation of future projects.

The main activities carried out in 2018 in the Andreeva Bay site include:

- The supply of a tugboat to pull the ITARUS platform, intended for the transportation of the components of dismantled submarines;
- The implementation of a solid waste interim storage facility;
- The supply of pre-treatment systems and technologies for solid radioactive waste and remote recovery facilities for landfilled waste;
- The supply of qualified staff and special vehicles for the transportation of solid radioactive waste.



Technical Assistance
JRC-ITU
(Germany)

Feasibility Study
Sunken Objects
(Russian Federation)

Technical assistance
NRPA
(Norway)

Cooperation Agreement
ONDRAF
(Belgium)

Global Partnership
(Russian Federation)

Radioprotection
Fugro Ocean
(United Kingdom)

Office, Moscow
Russian Federation

Cooperation agreement
SURAO
(Czech Republic)

Technical Assistance
reactor dismantling
JAVYS
(Slovak Republic)

Regional Technical Assistance
European Commission
(Georgia)

Engineering support
EURODIF
(France)

Cooperation Agreement
ANDRA / EDF / ITER
(France)

Office, Bratislava
Slovak Republic

Support to Radiation
Protection and
Nuclear Safety
KAPRNS
(Kosovo)

Support to Waste
Management
CERN
(Switzerland)

Office, Rome
Italy

Cooperation agreement
Enresa
(Spain)

RWM Project
European Commission
(Republic of Armenia)

Technical Assistance
JRC-ISPRA
(Italy)

Support to Waste
Management
NSPA
(Italy)



Training and capacity building
Doosan Heavy Industries
(South Korea)

Technical Assistance
Hangyang University
(South Korea)

Cooperation agreement
General Nuclear Power Group
(China)

Training and capacity building
Nuclear Safety Authority
(China)

Training and capacity building
MOST/VINATOM
(Vietnam)

Training and capacity building
TaiPower
(Taiwan)

4

RELATIONSHIPS WITH STAKEHOLDERS

STAKEHOLDERS' ENGAGEMENT

During 2018 financial year, Sogin updated its materiality analysis process; this process allows to identify the material issues studied and included in the 2018 Sustainability Report, in line with the GRI standards, used to draft the document.

Updating aims at analysing to what extent developments in the reference context – increasingly focused on ESG (Environmental, Social and Governance) aspects – impact on stakeholders' expectations and Sogin priorities. The analysis included studies on Sogin operative framework at a national level, global macro-trends and comparisons with other Companies similar to Sogin and operating in foreign countries.

In the conducted analysis, an issue is defined “material” because it has a real or potential impact on the Company, of economic, social or environmental nature, or it significantly affects the evaluation of the Company on behalf of the stakeholders. The materiality analysis was updated in the first half of 2019, starting from the elements collected to develop the materiality matrixes of the previous financial years, and it was conducted to meet the expectations of Sogin

management and stakeholders concerning the sustainability report.

The update was implemented through the procedures and operations reported below:

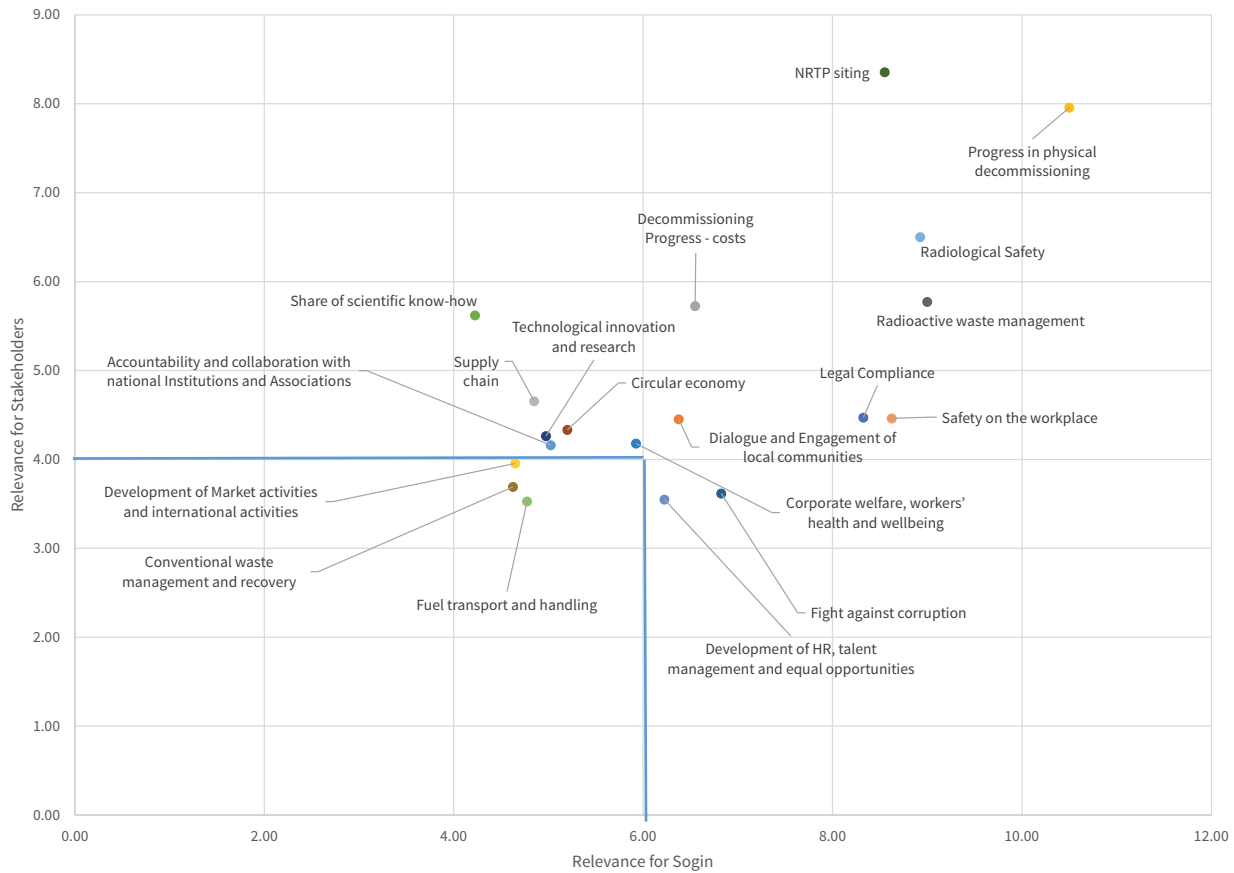
1. Identification of 19 material issues, divided into 4 areas (mission, accountability, vision, value creation), and identification of relevant stakeholders.
Issues and stakeholders have been identified through industry benchmarks and the analysis of the Group press review and documents (Ethical Code, procedures, Integrated Management System, etc.);
2. Qualitative questionnaire to the corporate management, aimed at:
 - Assessing the quality of the 4 subject areas (mission, accountability, vision, value creation);
 - Prioritizing the 19 identified material issues;
 - Providing a relevant scoring for identified stakeholders;
 - Identifying the 3 most relevant subjects for each category of stakeholders.



The outcomes of the materiality analysis are summarised in the following matrix: relevant subjects for Sogin and its stakeholders are located over the blue line outlining the quarter within the graphic. The subjects identified as “material” are reported in 2018 Sustainability Report, with other issues that, although located

below the threshold of “high relevance”, play an important role in the relation with the Group’s stakeholders. In the Appendix of this Document, you will find a table showing the link between the material subjects found in the analysis and the Reporting Standards of the GRI (Global Reporting Initiative), in which, for each subject, the reference standard and reporting scope are specified.

MATERIALITY MATRIX



STAKEHOLDERS' MAP

The Group recognizes as its stakeholders all engaged parties, institutions, organisations, groups or individuals that may affect or be affected by the Group's objectives and financial results.

Stakeholders are identified and classified according to their degree of influence on corporate decisions and their interest on the Company's activities.

These two elements are evaluated in terms of decision-making powers, legal or contractual obligations and connections with corporate strategies.

Relations with stakeholders are based on ongoing dialogue, sharing objectives and transparency.

Through a constant listening of requests and context analysis, Sogin detects the appropriate times, modalities and topics to draft a stakeholder engagement plan aimed at promoting a constant and structured dialogue to achieve the corporate mission.

The main stakeholder engagement activities carried out by Sogin in 2018 and divided into internal and external stakeholders are listed below.

- Employees and families
- Professional bodies
- Local communities
- Media
- International bodies, community and operators
- Local bodies and institutions
- National bodies and institutions
- Opinion leaders and national public opinion
- Suppliers and associations of undertakings
- Schools and universities
- Environmental associations
- Scientific and medical communities



DIALOGUE WITH STAKEHOLDERS

SOGIN AND TERRITORY

Sogin is in connection with the local communities hosting its sites under decommissioning. Local communities consist of several stakeholders, such as environmental associations, institutions, families, media or individuals. Each of them is involved by Sogin in discussions and events to share its activities and show the plants in which they are performed. Thanks to this approach Sogin builds long-lasting mutual trust.

Territorial training programmes

Sogin periodically organises school events and training courses to share the progress of its activities and relevant projects.

In 2018, the Company organised several training courses and corporate internships. In this framework, the Company has ratified an agreement with the G.B. Pentasuglia Technical Institute of Matera (Technological Sector) that has seen 4 students involved in a three-week stage in the Rotondella ITREC plant. The internship followed an initial training session in which students were explained decommissioning and waste management activities, and the National Repository plan.

Two internships for 2 third-year students enrolled as chemical experts in the Torriani Institute of Cremona and an internship for 5 students (chemists, electrotechnicians and mechanics) enrolled in the Galilei Sani institute of Latina were implemented in Latina nuclear power plant. University traineeship and internship programmes were also developed for graduate and postgraduate students of Siena University, La Sapienza University, Politecnico di Torino and Politecnico di Milano.

European Week for Waste Reduction (EWWR)

For the tenth anniversary of the European Week for Waste Reduction (EWWR), on 20 November 2018, Sogin organised an event in Garigliano nuclear power plant to discuss the topic of circular economy in the field of decommissioning. This event aimed at explaining how dismantling operations of nuclear power plants are designed, planned and implemented by ensuring the recovery and recycling of produced materials. On that occasion, the Company also presented to national, local medias and relevant local environmental associations, the strategies in place to reduce the environmental impacts of nuclear decommissioning operations.

Business Culture Week

Sogin joined the Business Culture Week – organised by Confindustria and Unindustria – and the campaign “Occupational Health and Safety in the presence of hazardous substances”, promoted by the European Agency for Safety & Health at Work (EU-OSHA) and fostered by Inail, in Italy, with a guided tour of Latina nuclear power plant, on 15 November 2019 for about 150 visitors. The tour was divided into two main activities: a tour of the nuclear power plant with the students of the Sani-Galilei Institute of Latina in the presence of Unindustria and INAIL representatives in the morning; and a workshop on “The management of hazardous substances in Sogin’s sites”, held in collaboration with Unindustria Latina and the Latina Association of Engineers, to investigate the radiological and chemical safety of decommissioning operations.

European Researchers’ Night

In 2018, Sogin took part in the European Researchers’ Night, the European event, started in 2005, that promotes scientific research among EU citizens through laboratories, workshops, installations, experiments and scientific games in more than 340 cities of 30 EU Countries.

Sogin Group joined the event with 3 exhibitions, 2 in the ENEA Casaccia Centre and 1 in Reggia di Caserta. In Casaccia, Sogin and Nucleco has involved participants with interactive experiments and guided tours, one on the OPEC 1 facility and the second in Nucleco radiometric laboratory and treatment plants. More than 150 people joined the tours. Children have been involved in laboratory games and in an “Escape Room” based on the nuclear topic.

On Friday 28th and Saturday 29th of September, Garigliano staff organised two guided tours in the mobile laboratory in which the “total body” instrument was presented, which allows measuring radioactivity levels of the human body.

RELATIONS WITH INSTITUTIONS

Sogin develops a constant dialogue with the institutions involved in decommissioning operations, both at a national and local levels. Sogin's relationships with institutions are subject to the reference legislation and are supported by a constant engagement in discussions based on information transparency and accuracy. For this reason, several meetings are held at regular intervals to investigate relevant aspects of the decommissioning operations.

Institutional Visits

Sogin holds regular meetings with national and local representatives to show its progress in the decommissioning of nuclear power plants and radioactive waste management facilities.

In the framework of the Work No. 60 on the management and safe maintenance of nuclear waste, the tenth **Permanent Commission on Industry, Trade and Tourism of the Italian Senate**, has carried out four visits to Casaccia (26 October 2018), Saluggia (16 November 2018), Rotondella (23 November 2018) and Caorso (25 January 2019) sites.

During the visits, the members of the Commission had the chance to obtain detailed information on dismantling activities, radioactive waste management operations and decommissioning progress.

Discussion with independent bodies

Sogin is in tight connection with all independent bodies engaged in promoting accurate information on the Italian decommissioning operations.

Through Ministerial Decree, the Ministry for the Environment and Protection of the Land and Sea, established an **Environmental Monitoring Centre in Garigliano nuclear power plant**. This permanent facility is engaged in monitoring the plant's decommissioning operations.

Visits to foreign Repositories

Sogin holds regular guided tours with its stakeholders to other radioactive waste Repositories in Europe. These visits aim at: showing the functioning and activities of an infrastructure similar to the National Repository that will be implemented in Italy; collecting examples and testimonies of local CEOs and citizens; and investigating relevant aspects of the stakeholder engagement process, required for the repository implementation.

On 19 June, Sogin staff visited the Centre de Stokage de L'Aube (CSA) with a delegation of the Environmental Commission of Piemonte Region; this final repository for low-level and intermediate-level waste is operated and managed by ANDRA, the French National Radioactive Waste Management Agency.

Memorandum of understanding with the Commander of the Carabinieri Environmental Protection Section

In 2012, Sogin ratified a three-year agreement with the Commander of the Carabinieri Environmental Protection

Section, that was renewed in 2018, aimed at collaborating in the operations of recovery and securing orphan radioactive sources, namely those whose origin and ownership are unknown.

After the identification of an orphan radioactive source and the request to competent authorities (judicial authority, Prefecture etc.) the Commander of the Carabinieri Environmental Protection Section, notifies the detection of the source to Sogin.

Sogin provides a competent technician to evaluate the best intervention to implement and the operation costs for the management and disposal of the radioactive sources.

The competent authority can exploit Sogin expertise to plan, coordinate and implement the transfer and safe maintenance of radioactive waste.

Moreover, with the memorandum of understanding, Sogin commits in the management and safe maintenance of the radioactive waste resulted from the personal protection equipment used by the Commander of the Carabinieri Environmental Protection Section during joint actions. As for training, the agreement provides for the participation of the Commander of the Carabinieri Environmental Protection Section in Sogin training programmes on safety and radioprotection.

Relations with local institutions

In 2018, institutional and technical meetings were held to update the Municipalities, the Provinces and the Regions hosting Sogin sites on the progress of decommissioning activities. Among these meetings:

- 14 June 2018 – Technical nuclear roundtables in Saluggia (VC) Region of Piemonte;
- 25 September 2018 – Technical roundtables on environmental compensation and re-balance of Region of Piemonte;
- 2 October 2018 – Technical roundtable, Municipality of Trino;
- 9 October 2018 – Meeting with the Commission for decommissioning Region Emilia Romagna.

Conferences of Services

As provided for under the Legislative Decree No. 152/2006, the conferences of services are intended to discuss the approval of remediation operations in contaminated sites, and they involve all concerned local bodies.

Based on these provisions, in 2018, Sogin took part in three conferences of services for the approval of the remediation procedures in Garigliano, Rotondella e Trino sites (further information is provided in the "Environment" section).

Communication plans as under the EIA

In order to comply with the EIA Decrees, Sogin should prepare communication plans, to be submitted to local bodies for approval.

Each communication plan includes different actions such as the implementation and development of RE.MO. portal (Monitoring Network), leaflets, guided tours in the sites, press conferences and transparency roundtables.

Regional Transparency Roundtables

The Regions hosting nuclear sites under decommissioning, organise Transparency Tables and regular meetings based on specific provisions and regional regulations, to discuss the progress of the dismantling operations and radioactive waste management with Sogin and update local stakeholders

(citizens, institutions and associations), especially in terms of safety and environmental protection.

These meetings aim at investigating and discussing the most relevant issues of decommissioning with representatives of regulatory bodies, businesses and environmental associations.

In 2018 the following Transparency Roundtables were held:

- 26 January – Transparency Roundtable of Emilia Romagna Region;
- 7 March – Transparency Roundtable of Piemonte Region;
- 26 July– Transparency Roundtable of Basilicata Region.

All meetings were an opportunity to promote a dialogue between Sogin and local stakeholders of the areas in which decommissioning and radioactive waste management operations are carried out.

RELATIONS WITH MEDIA

Media relations are the means to provide accurate and transparent information on Sogin corporate mission through several channels of communication (press, tv and radio), and by building solid relations that may help the Group talk about its job.

In 2018, media relations focussed on nuclear decommissioning and its technological and management challenges, including the operations carried out by Sogin for third parties.

A few examples:

- 10 March -TV service about the decommissioning of Latina nuclear power plant broadcasted during the TV show “Linea Verde” on RaiUno channel;
- 19 April - Press conference to present Sogin 2017 outcomes and 2018 objectives - the news appeared in more than 140 articles on newspapers/websites, radio and TV services;
- 20 June - Press Release “Caorso, first transport to Slovakia of radioactive resins and sludge”;
- Vienna, 17 September - Press Conference of the 62nd General Conference of the IAEA, in which the outcomes of the Agency Technical Review about the dismantling of Trino and Garigliano vessels, were presented to a group of journalists from the main national newspapers;
- 20 November - Press Conference in Garigliano nuclear power plant during the event to join the tenth edition of the European Week for Waste Reduction (EWWR), attended by journalists from the main national newspapers, with a total of 130 articles in several media.

In 2018, Sogin renewed tours and visits to the nuclear plants under decommissioning for journalists. See, for example, the news reports on *Gazzetta del Mezzogiorno* ed. Basilicata of 16 October on the purification of underground water in Rotondella Itrec plant and the special *TG2 RAI* of 9 December, on the decommissioning of Garigliano nuclear power plant and Sogin circular economy.

During 2018, all relevant institutional meetings and events, such parliamentary hearings, Transparency Roundtables and Sogin and Nucleco trade shows in the nuclear field (Ecomondo and RemTech EXPO) were attended, monitored and reported by social media.

Sogin overall presence on the media in 2018 amounted to 2,781 news. 790 press articles, 1,704 web news and 287 broadcasting services, 229 TV services and 58 radio services. 3 press conferences were also organised.

11 press releases and reports appeared on the websites (sogin.it, nucleco.it and depositonazionale.it) with relevant news on the Group; regular updates have been also provided. In addition to the Youtube SoginChannel, communication/information campaigns on Sogin events and activities also continued via the LinkedIn corporate profile, with a total of about 180,000 views. Notably, the number of followers has increased (7,174 in 2018 compared to 4,800 in 2017).

NETWORKING

NATIONAL NETWORK

Sogin considers it of fundamental importance to inform its national and local stakeholders on its corporate mission and the progress in the dismantling operations and radioactive waste management. To this extent, the Company regularly holds and joins events and debates intended for the stakeholders, facing several topics based on the stakeholders' needs.

Industrial Associations

Sogin regularly collaborates with national and local industrial associations.

The Company is a member of *Confindustria Basilicata*, *Confindustria Piacenza*, *Confindustria Vercelli Valsesia*, *Confindustria Caserta* and *Unindustria Lazio*; it also works in concert with other regional associations of undertakings, among which *Compagnia delle Opere della Campania*, *Confapi Matera*, *Pensiamo Basilicata*, *Agci Lazio*.

RemTech

From 19 to 21 September, Sogin Group joined the technical and scientific session of the RemTech 2018 trade show, to which it contributed with an exhibition area and several speeches; this Italian trade show mainly focuses on the remediation of contaminated sites and environmental protection and redevelopment, and it involves private companies, public bodies, universities, research centres, associations, professionals and the industrial world.

Ecomondo

From 6 to 9 November, Sogin Group took part in the international trade show Ecomondo 2018, focused on energy and material recovery and sustainable development; the Company installed an exhibition area about Nucleco and its activities, and took part in conference sessions on environment, remediation and decommissioning. A VR headset was also part of Sogin's stand, this technological device, in fact, can be widely used within nuclear plants, to plan maintenance activities or to monitor construction or dismantling progress.

Scientific Committee on Decommissioning

Sogin joined the event of the Scientific Commission on Decommissioning held in Rome: "National Programme: what's next?". The event provided the opportunity to show the progress of Sogin's activities and investigate the siting of the National Repository.

AIN

On 10 October, Sogin took part in the AIN (Italian Nuclear Association) National Day Nazionale, with the title "Let's plan a safe future, Italy should start the operation of the National Repository for disposal".

During the event, Sogin presented the design of the National Repository and the latest developments on its siting.

INAIL

On 28 November, Sogin joined the INAIL conference in Bologna on the "Safety and reliability of pressure equipment (SAFAP)" to present the project of the National Repository, underlining the importance of engaging stakeholders in its siting.

Think Tank Trinità dei Monti

On 30 November, Sogin took part in the technical conference entitled "Circular Economy: challenges and opportunities", organised by the Think tank "Trinità dei Monti" in the Nilde Iotti Hall of the Chamber of Deputies in Rome.

During the event, Sogin explained the concept of circular economy applied to nuclear decommissioning and outlined the importance of introducing circular economy strategies in every industrial chain to promote sustainable development and contrast the growing pressure of production and consumption on natural resources and environment.

AIRP

Sogin took part to the 37th AIRP (Italian Radioprotection Association) National Congress, held in Bergamo from 17 to 19 October and presented 7 reports on "Nuclear power plants" and "Measurements and quality" and two posters, one for each thematic session.

Order of Engineers of Rome

On 18 October, Sogin joined the Seminar of the Order of Engineers of Rome, held in the headquarters of the National Research Centre, and called "Information and communication in the nuclear field", with a presentation to introduce the project of the National Repository.

Global Compact Network

In 2018, Sogin continued to broaden its network, by taking part in the activities of the Italian Global Compact Network Foundation, whose objective is to promote the development of the UN Global Compact in Italy. This action aims at fostering the culture of corporate citizenship. The main topics of 2018 were the circular economy and the supply chain.

Collaboration with UNIBA

In 2018, within the framework of the collaboration agreement ratified between Sogin and the Physics Department of the University Aldo Moro of Bari, four students enrolled in the “Master for radioactive and industrial hazardous waste management and environmental protection strategies” visited Rotondella, Garigliano and Latina sites. These tours were part of a wider programme, as under the ratified agreement, on the decommissioning of nuclear power plants.

Partnership with “Sant’Anna” School of Advanced Studies in Pisa

Sogin is a partner of the centre coordinated by the “Sant’Anna” School of Advanced Studies of Pisa, ranked fourth in the

ministerial 2018-2019 list to finance the promotion and implementation of applied research projects, technological know-how and training on high-tech devices, within the 4.0 Industry Plan. Sogin’s participation aims at developing and implementing innovation projects, industrial research, experimental robotics, VR and simulation solutions – to be introduced in the nuclear decommissioning field and in the management of radioactive waste.

GEO Conference

On January 22, Sogin took part in the conference entitled “The new Italian sustainable development strategy and Green Economy opportunities” held by the GEO, Green Economy Observatory of the IEFÉ-Bocconi University.



INTERNATIONAL NETWORK

Sogin contributes in developing an international network on nuclear decommissioning and radioactive waste management through its relations and collaborations with international organisations and foreign, public and private, operators.

Institutional Collaborations

Due to its public nature and its relevant expertise in the field of decommissioning and nuclear radioactive waste management, Sogin fosters the dialogue with top experts in the field, by taking part in the most relevant international forums and in initiatives and working groups of the main international organisations such as:

- The bodies of the European Commission engaged in nuclear field, namely the Directorate-General Energy (DGENER), the Joint Research Centre and the EURATOM Supply Agency;
- The Nuclear Energy Agency - NEA of the OECD – Organisation for Economic Co-operation and Development;
- The International Atomic Energy Agency – IAEA of the United Nations.

Moreover, Sogin represents the Italian Government, its bodies and other national institutions involved in the nuclear sector, by providing its expertise in international institutional

meetings. In that regard, the Company, appointed by the Italian Members of OECD and in agreement with the Ministry for Economic Development, joins the annual meeting of the NEA Steering Committee, as observer.

In 2018, the Company took part in the IAEA General Conference, held in Vienna from 17 to 21 September, in which it provided technical support to the Italian Permanent Representative on specific topics (decommissioning and radioactive waste management).

Sogin also joined the IAEA Nuclear Science and Technology Conference held in Vienna from 28 to 30 November 2018, and the Nuclear Safety and Security Group (NSSG) of the G7, at the request of the Ministry for Foreign Affairs in terms of gender equality.

Sogin took part in the 6th Review Meeting - Joint Convention IAEA on the safety management of irradiated fuel and radioactive waste. The meeting took place in Vienna and

aimed at providing a comprehensive overview on the management of radioactive waste and irradiated fuel in Italy, on behalf of the Italian Government and Ispra.

The Company took part in the workshop “International Best Practices and Lessons Learned on the Public Engagement of the Back End of Fuel-Cycle”, of *La Sapienza* University of Rome. This event allowed experts to discuss and investigate HONEST, the project of the European Commission aimed at collecting the experiences of several Countries in terms of stakeholders’ engagement and consensus on nuclear sector. Other relevant institutions joined the event with Sogin, among them: ENEA, ISIN, Andra, the French National Radioactive Waste Management Agency and SSM, the Swedish Radiation Safety Authority.

For the first time, Sogin joined the International Forum on the decommissioning of Fukushima nuclear power plant, organised by the Japanese Company Nuclear Damage Compensation and Decommissioning Facilitation Corporation (NDF) in cooperation with the NEA and the IAEA. At its third edition, the Forum aims at fostering discussions and providing updates about the population affected by the consequences of the 2011 nuclear accident. During the Forum, Sogin delegation visited Fukushima nuclear power plant and presented the Group projects to the NDF managers.

As a relevant stakeholder in nuclear field, also in 2018, Sogin joined several working groups of the OECD/NEA and the IAEA, focused on five main subjects: decommissioning; waste management; radioprotection; technical regulation and nuclear safety standards; communication to stakeholders.

THEMATIC AREAS	PROJECTS AND WORKING GROUPS
Decommissioning	<p>Sogin appoints a representative for the Committee on Decommissioning of Nuclear Installations and Legacy Management (CDLM) of the NEA. It is part of the Working Party on Decommissioning and Dismantling (WPDD) and of the International Cooperative Programme on Decommissioning (CPD), the most relevant OECD/NEA projects for the exchange of experiences in terms of decommissioning of nuclear power plants.</p> <p>The Company attends the Decommissioning Cost Estimate Group for the elaboration of correct methodologies to estimate the costs of decommissioning and waste management.</p> <p>Among the IAEA projects, Sogin is engaged in the DACCORD Phase 2 three-year project (2016-2019) “Data Analysis and Collection for Costing of Research Reactor Decommissioning”, for the implementation of a world benchmark on the dismantling costs for research reactors, and the development of better methodologies to elaborate the cost estimate, assess the impacts of the characterisation strategies on costs, analyse and evaluate the level of uncertainty of estimates.</p>
Waste management	<p>Sogin appoints a representative for the Radioactive Waste Management Committee (RWMC) of the NEA. It takes part in the annual plenary meeting of the European Nuclear Energy Forum (ENEF) and in the works of the Club of Agencies, a forum created for the free circulation of information among organisations in the field of waste management, officially recognised by the WENRA (Western European Nuclear Regulators Association) and by the European Commission as models for the European Standards and Safety Reference Levels in the field of waste management and final disposal.</p> <p>Among the IAEA projects, Sogin is included in the International Project on irradiated Graphite Processing Approaches – GRAPA, connected to the management of irradiated graphite, and in the International Low Level Waste Disposal Network, a network of international experts who are currently working in operating disposal repositories or in facilities under implementation/licensing, in order to share knowledge on radioactive waste management.</p>
Workers and people radiological protection	<p>Sogin appoints a representative for the Committee on Radiological Protection and Public Health of the NEA and joins the IAEA project “Modelling and Data for Radiological Impact Assessments Project” aimed at improving and harmonizing the international standards to assess the radiological impact of radioactive release, as well as the WGDECOM - ISOE Working Group on Radiological Protection Aspects of Decommissioning Activities at Nuclear Power Plants.</p>
Technical regulation and nuclear safety standards	<p>Sogin contributes to the development of international nuclear safety standards and in introducing them in technical regulations and best practices at a national level.</p> <p>Sogin also appoints the chairman of the technical commission “Nuclear Technologies and Radiological Protection” of the Italian Regulatory Body (UNI), which also attends the activities of the technical committees in charge for the nuclear sector (CEN - Comité Européen de Normalisation and ISO - International Organization for Standardization).</p>
Communication to stakeholders	<p>Sogin yearly joins the Forum on Stakeholder Confidence (FSC) of the Nuclear Energy Agency (NEA), the nuclear department of the Organisation for Co-operation and Economic Development (OECD). This is the most important permanent technical meeting on the stakeholder engagement in the field of decommissioning and radioactive waste management.</p>

Collaboration with foreign operators

Sogin establishes and consolidates relations with the most important foreign operators, in both public and private sector, aimed at sharing know-how and experiences and implementing beneficial synergies in the framework of the growing relevance of decommissioning in the global market.

The collaboration agreements ratified and implemented in 2018 with international bodies and organisations are listed below.

- **EDF Collaboration Agreement** (Electricité De France) to share scientific/technical know-how on subjects of mutual interest for the dismantling of nuclear reactors. At the end of 2018, two mixed working groups (Sogin – EDF) were created to discuss “Strategies and Technologies for the dismantling of PWR and gas-graphite reactors”, their operations started in January 2019.
- Collaboration agreement with the **research and consulting Company MRI** (Mitsubishi Research Institute, Inc.), to launch future nuclear and industrial cooperation between Japan and Italy.
- **Collaboration agreement with SURAO**, the Czech State-owned Company in charge of operating the Dukovany national repository for radioactive waste, to promote an exchange of information and know-how in the field of radioactive waste management.
- Collaboration agreement with **ENRESA** (Empresa Nacional de Residuos Radiactivos SA), the Spanish state-owned Company in charge of waste management and the implementation of a storage facility for low-level and intermediate-level radioactive waste, to promote an exchange of information and know-how in the field of radioactive waste management.
- Collaboration agreement with **ANDRA** (Agence Nationale Pour La Gestion Des Déchets Radioactifs), the French state-owned company in charge of radioactive waste disposal, to promote an exchange about radioactive waste management.
- Collaboration agreement with **ONDRAF** (Organisme National Des Déchets Radioactifs Et Des Matières Fissiles Enrichies), Belgian state-owned Company in charge of waste management and implementation of the Dessel Repository, to promote an exchange of information and know-how in the field of radioactive waste management.
- Collaboration Agreement with **ITER** (International Thermonuclear Experimental Reactor), the international megaproject run by the European Union, Russia, China, India, Japan, South Korea and the United States for the implementation of an experimental thermonuclear reactor. The agreement, based on the exchange of technical and scientific know-how, includes several topics, such as radioactive waste management, nuclear infrastructures, and the review of nuclear engineering and nuclear safety projects.
- Collaboration agreement with **CGN/CNPEC** (China General Nuclear), to promote the exchange of know-how and experiences in the field of decommissioning of nuclear power plants and radioactive waste management.

KNOW-HOW DEVELOPMENT

RADWASTE MANAGEMENT SCHOOL

The Radwaste Management School is the training centre of the Sogin Group which ensures high-level professional updating and promotes managerial and technological innovation based on the experience and specialized know-how related to the issues of decommissioning and waste management radioactive, which make the Group a major player in the national and international industrial panorama. Founded in 2008, it is also open to professionals coming from institutions and companies and represents a reference point for safety management in industrial processes.

The RMS is part of the **strategic assets** for achieving the mission of Sogin and Nucleco. The development of highly specialized know-how is part of the Sogin strategy to guarantee maximum safety and implement an integrated knowledge management, education and training system. This is done in the light of transferring skills to future operators and satisfying the increasing knowledge demand in the sector both at international and national level.

This can be summarised in the following objectives:

- **training:** train the resources of the Sogin Group, with special attention to the safety, management of radioactive waste and nuclear fuel;
- **knowledge management:** ensure integration, enhancement and sharing of the *knowledge management* system;
- **dialogue:** dialogue with universities and training centres;
- **New excellence:** Train the “operators of the future”, for example, university and high school graduates in subjects related to the decommissioning and radioactive waste management.

The training programme of the Radwaste Management School (RMS) ensures the best standards of innovation,

multi-disciplinarity and a specific focus on decommissioning and radioactive waste management. Programmes are constantly updated, to meet the mandatory requirements and training obligations of the Sogin Group, mostly in accordance to the integrations of the Consolidated Act on the protection of health and safety in the workplace (Legislative Decree No. 81/2008) and, for the subjects specifically related to nuclear activities, according to the Legislative Decree No. 230/1995 and subsequent amendments and integrations.

The provided courses, both general and specific, focus on technical and scientific subjects, such as technologies of nuclear power plants or radiological protection.

The School is certified with UNI EN ISO 9001/2015 (Quality Management system), ISO 14001/2015 (Environmental Management System), OHSAS 18001/2007 (Safety and Health in the Workplace) for sector EA37 (training). It is also recognized by the National Nuclear Safety Authority (ISIN) as a qualified organization, in accordance with Article 58-ter of Italian Legislative Decree No. 230/1995, to provide specific training courses for Sogin staff and suppliers involved in nuclear decommissioning, safe maintenance and management of spent fuel and radioactive waste. The certification issued by the RMS is valid in Italy.

The School also provides special and specific training courses for suppliers with specific needs.

The School is also constantly committed in developing partnerships with accredited bodies, universities, scientific associations, research and development bodies, also at an international level. The institution is involved in university training, through seminars and graduate and post-graduate courses.

RMS OBJECTIVES



Training



**Knowledge
management**



Dialogue



**New
Excellence**

AREAS	ACTIVITIES
Advanced Training in Italy	<ul style="list-style-type: none"> • First level master's degree on decommissioning and hazardous radioactive waste management with the University of Eastern Piemonte (UPO) and the "Aldo Moro" University of Bari, with master's degrees awarded to the students who joined the two courses. • Training support in the first and second level international master's Degrees in "Protection from CBRN events" at Tor Vergata University, through an ongoing partnership (2014-2019). • Teaching assignment in the second edition of the "Strategy Energy Management Systems" Master at "La Sapienza" University of Rome. • Collaboration Agreement with the Chemistry Department in the field of radiological characterisation of nuclear sites and optimisation of the remediation strategy. • Partnership with CIRTEN (National Intra-university Association for Nuclear Technological Research), to train Sogin staff on nuclear safety and to perform studies and researches on the correct management of radioactive sources and waste, and on technological and engineering issues connected to decommissioning activities. • Launch of shared programmes with INAIL, for research, training and technological innovation on the decommissioning of nuclear power plants and on radioactive source and waste management, aimed at promoting protection and prevention for workers and population. • Partner of the Highly Specialised Competence Centre managed by "Sant'Anna" School of advanced Studies. • Partner in school projects and specific graduate and post-graduate courses, especially at "La Sapienza" University of Rome, LUMSA and LUISS in Rome.
Advanced Training Abroad	<ul style="list-style-type: none"> • Partnership with the International Summer School on Nuclear Decommissioning and Waste Management managed by the Joint Research Centre of the European Commission with the IAEA, Milan University of Studies and the Italian Association on Radiological Protection (IRPA - AIRP). • Partnership with the European Project ELINDER (European Learning Initiatives for Nuclear Decommissioning and Environmental Remediation), sponsored by the JRC, which aims at training professionals to be employed in decommissioning and waste management activities. • Teaching assistance at Politecnico di Milano in 2018 to provide a three-week course on radioactive waste management to the representatives of the safety authority and nuclear staff of the People's Republic of China within the framework of the "Cooperation program for environmental protection" programme, ratified by Italy and China.
Local Advanced Training	<ul style="list-style-type: none"> • Technical and scientific seminars and courses in the nuclear plants and facilities, for young high-school graduates and students in line with the "Learning and Working" project. • Lessons for the annual TAES course (Technicians for Environment, Energy and Safety) held in Vercelli by COVERFOP, financed with European funds, with its last edition in 2018. • Participation to the workshop on "Hazardous substance management in Sogin sites", organised within the scope of the EU-OSHA campaign and during the European Business Culture Week promoted by Confindustria and Unindustria.

2018 Performance

The following tables show the training hours provided by the RMS and divided by type, target, gender and professional profile.

The RMS training courses were adapted to the amendments occurred in the regulatory framework, as for the mandatory training, and to the updates of some staff jobs in the Group. These modifications led to a 30% increase of training courses in the last two years.

About 800 individuals employed in Sogin and Nucleco took part to 221 mandatory corporate training courses in 2018 provided by the RMS (with an increase of 57% compared to the courses provided in 2017). Total teaching hours amount to 2,902, of which 96% provided for the training of the Sogin Group staff. 90 teachers from Sogin worked for a total of 1,333 hours.

Training hours provided by the Radwaste Management School – 2018 Divided by type and target

	Hours
Nuclear Safety	11,592
Hours provided to Sogin Staff	11,268
Hours provided to Nucleco Staff	304
Hours provided to the staff of external companies	20
Safety in the Workplace	7,737
Hours provided to Sogin Staff	7,705
Hours provided to Nucleco Staff	12
Hours provided to the staff of external companies	20
TOTAL	19,329

Training hours provided to Sogin and Nucleco staff at the Radwaste Management School – 2018 Divided by gender

	Nuclear Safety	Safety in the Workplace	Total
Women	3,564	1,299	4,863
<i>Sogin</i>	3,512	1,295	4,807
<i>Nucleco</i>	52	4	56
Men	8,008	6,418	14,426
<i>Sogin</i>	7,756	6,410	14,166
<i>Nucleco</i>	252	8	260
TOTAL	11,572	7,717	19,289

Training hours provided to Sogin and Nucleco staff at the Radwaste Management School – 2018 Divided by professional profile

	Nuclear Safety	Safety in the Workplace	Total
Managers	154	16	170
<i>Sogin</i>	142	16	158
<i>Nucleco</i>	12*	-	12
Executives	1,898	964	2,862
<i>Sogin</i>	1,886	960	2,846
<i>Nucleco</i>	12	4	16
White collars	7,492	4,361	11,853
<i>Sogin</i>	7,408	4,353	11,761
<i>Nucleco</i>	84	8	92
Blue collars	1,916	2,208	4,124
<i>Sogin</i>	1,720	2,208	3,928
<i>Nucleco</i>	196	-	196
Fellowship/Traineeship	0	0	0
<i>Sogin</i>	-	-	-
<i>Nucleco</i>	-	-	-
Employees seconded by ENEA	112	168	280
TOTAL	11,572	7,717	19,289

* This figure refers to the training provided to the CEO.

TRAINING AND PROFESSIONAL DEVELOPMENT

Sogin promotes training courses and updates for its staff through specific training programmes, according to their professional profiles, competences and potential and in line with the corporate needs. This is to provide the staff with the appropriate skills and tools to meet the needs resulting from organisational, legal and external changes.

The training activities provided to Sogin staff in 2018, were divided as follows:

- Specific technical training, with special focus on the new IT systems to be used in the digitalisation of corporate processes, financial and administrative issues for the implementation of new corporate processes and operation procedures in managing project risks;
- Training on legislative updating (European Directives, New Public Procurement Code and accounting, new European regulation);
- Training for the implementation and consolidation of soft skills;
- Language Training;
- On the job training to share the know-how with the staff employed in new job tasks.

According to the satisfaction questionnaires, the training courses met the requirements and objectives, and recorded a high level of satisfaction among Sogin personnel.

Performance-Evaluation Process

Sogin awarding policy is based on the merit achieved during the year in terms of individual and corporate outcomes.

Such awards may consist of salary increases, of variable nature, allocated through individual and collective bonuses (achievement bonus), targeted development interventions with horizontal or vertical career advancements, specific training activities.

Managers and executives are provided with a Management by Objectives (MBO) System, mainly based on corporate objectives linked to the business achievements.

Development of Human Resources

The “Talent Management” project continued in 2018, and it involved about 50 Junior resources. Notably, the project aimed at developing soft skills and technical competences to foster a career advancement in the job task performed, by promoting job rotation. Several initiatives have been implemented in 2018 for the resources engaged in Talent projects, such as: team coaching meetings with the CEO, corporate mentoring with mentors chosen among the

Managers, specific training on the four key processes of the Company to provide an overall vision of the corporate reality. In 2018, the internal mentoring project also continued.

Within the scope of development and enhancement of human resources, and in order to underline the corporate effort to ensure equal opportunities for the access to high-level leading and management roles, one of the objectives set out in 2018 was the implementation of inclusion policies and the launch of programmes and projects aimed at promoting the corporate gender diversity. To this extent, Sogin joined the association “ValoreD”, which promotes gender balance and inclusive culture to enhance corporate and national growth. In 2018, Sogin took part in the survey “Talent senza età” (Ageless Talents), promoted by the association in partnership with the Catholic University, to investigate the needs and potential of workers above 50 years of age.

In May, the project P.O.W.E.R. was launched, namely a six-month individual mentoring programme intended for the female middle management class. This project consists of a series of one-to-one meetings between an experienced mentor, who shares its knowledge and experiences with a less experienced mentee, who wants to improve its career.

ATTENTION TO HUMAN RESOURCES

The Human Resources Management Policies of the Sogin Group embody the principles of the Ethical Code, by guaranteeing people dignity and equal opportunities, the absence of impediments for a professional growth, based on gender, religion, politics and personal beliefs, race, ethnicity, sexual orientation or civil status, and the full implementation of one's potential. Sogin and Nucleco protect their workers and their integrity and dignity in both Companies, no form of irregular work is tolerated. Interpersonal relations among employees are also based on the mutual respect of the individual and its professional skills, thus, avoiding behaviours that may compromise its physical and psychological integrity, lead to any kind of discrimination and creating an environment in which everybody can express its potential. Paying attention to human resources in Sogin means taking care of industrial relations, developing communication campaigns for workers and promoting safety in all its aspects.

INDUSTRIAL RELATIONS AND CORPORATE WELFARE

NoiSoginWelfare Project

In December 2017, Sogin and its trade union organisations ratified an agreement on the Achievement Bonus 2017, fund 2018, through which the corporate welfare was first introduced in Sogin.

This system allows Sogin to award its employees with the 2017 Achievement Bonus free of taxes, thus, reducing the tax wedge by 100%, in compliance with the 2016 Stability Law.

To inform about the initiative in all its aspects, Sogin held an informative roadshow, from 14 May to 1 June, in all Sogin sites. Meanwhile, a specific platform called NoiSoginWelfare was implemented for the employees who want to join the welfare project; the platform can be accessed from the corporate intranet portal. From 11 to 30 June, Sogin employees who satisfy the legal requirements had the chance to choose the productivity share of the bonus to allocate for the welfare services available on the NoiSoginWelfare platform. Moreover, an agreement was ratified with national trade union organisations concerning the 2018 achievement bonus, fund 2019, in line with the developments of the regulatory framework.

In 2018, the managers of the corporate trade union ratified a memorandum of understanding with the Company, which defined an incentive mechanism, in compliance with the provisions of art. 4 of Law No. 92/2012 (the so called Fornero Law), allowing the gradual turnover of managers towards retirement.

Sogin trade-union membership in 2018 amount to 63%.

People Care

The project, now at its 8th edition, aims at supporting the employees towards the reconciliation between work and private life, through a set of services which meet their specific needs.

In February 2019, the contributions for the requests of year 2018 have been allocated:

213 contributions have been allocated to about the 10% of employees, for a total amount of EUR 32,319.07 (EUR 1,981.09 for year 2017 and EUR 30,337.98 for year 2018).

Contributions have been mostly allocated for school canteens (EUR 20,193.09 equal to 62.67% of total allocated funds), university fees (EUR 6,155.88 equal to 18.65% of total allocated funds), nursery (EUR 5,235.27 equal to 16.44% of total allocated funds), school textbooks (EUR 734.83 equal to 2.25% of total allocated funds).

Within the scope of the People Care project, several conventions and agreements with commercial establishments have been ratified (Food & Beverage, Healthcare & Wellness, Shopping, Facilities).

Supplementary pension scheme

Along with traditional pension schemes, Sogin offers a supplementary pension scheme through the Employee Pension Fund (FOPEN) and the Manager Pension Fund (FONDENEL). Starting from 2007, as stated by law, each employee can transfer the whole severance payment to the supplementary pension fund. Nucleco also offers to its employees and managers the chance to join the FOPEN and PREVINDAI Pension Funds. On 31 December 2018, the number of Sogin employees who the fund amounts to 700.

Subsidised loans

In line with the actions implemented in the electric sector and within the limits of the available resources stated under the second level collective bargaining, Sogin provides subsidised loans to its employees for the purchase or renovation of home and for special personal needs.

Healthcare assistance

Sogin employees and their dependants, insurance covers are provided for healthcare assistance with the Supplementary Healthcare Fund for the Employees of Enel Group (FISDE). As for the accident insurance the Company concluded specific accident policies for its employees. Managers are provided with the same kind of supplementary healthcare assistance through the ASEM Fund. Similarly, Nucleco offers healthcare assistance to its employees and their dependants and relatives through the FISDE Fund.

Non-professional insurance policies

Under the provisions of the collective bargaining of the Electric Sector, Sogin offers to its current employees an insurance cover in the event of death or permanent invalidity following non-professional accidents and a cover insurance policy for the risk of death due to disease.

Leisure

ARCA leisure association for the employees of the electric sector, aims at promoting cultural and sport actions and events to gather together the employees and their families. The association also organises tours and holidays with the best tour operators in the market. Managers are provided with this service by ACEM which takes care of the leisure activities for this category.

ACTIONS FOR INTERNAL STAKEHOLDERS

Caritas

In February, following the severe winter weather, a voluntary collection of blankets and sleeping bags for the Catholic association Caritas was implemented by the employees of Sogin Rome headquarters.

Children in the office

On 25 May 2018, Sogin headquarters joined the initiative of *Corriere della Sera* called “Children in the office with mum and dad”, in its 24th edition.

52 children, aged between 3 and 10, had the chance to “explore” the workplace of their parents and take part to games and laboratories on nuclear decommissioning, such as: dismantling a nuclear power plant made of Lego bricks, planning the reuse and recovery of a decommissioned power plant or wearing the personal protective equipment of Sogin staff.

Older children, aged between 9 and 10, were involved in a laboratory called “A day in the newsroom” during which they simulated the drafting of an article about SoginNews corporate house organ day.

This was a special opportunity for both children and parents; young participants had the chance to look closely at the work environment and colleagues of their parents, while parents experienced a different day with their children.

Futsal Competition

In May, Sogin Group has held its first Futsal Competition which was joined by 13 teams with more than 130 players: 2 teams from the Headquarters, 3 team from Nucleco and 1 team for each site.

News from Volunteering

The intranet section “News from Volunteering” is active from 2016, and it publishes news on the volunteering activities of employees.

SoginNews Magazine

In 2018 Sogin continued with the publication of the magazine SoginNews, another tool to communicate and investigate Sogin news with the intranet portal.

The magazine is printed in 2,000 copies on recycled paper and distributed to all the sites of Sogin Group every three months. This tool outlines the progresses in core business activities, the development of international actions and other news related to the Company. It is open to external collaborations, to better place the Group activities within the social and economic framework both at a national and international level.

Legal News

In 2018, the issue of a monthly Legal News was confirmed. This tool allows informing readers about new regulations and institutional events through the corporate intranet. It was originally founded at the end of 2014.

Section “A tour to the newsstand”

In 2018, the weekly digital section “A tour to the newsstand – Press release extracts” was reconfirmed, to spread the most relevant articles of the press release on the intranet portal.

SAFETY OF WORKERS

According to Sogin, safety is a strategic asset in the decommissioning of nuclear power plants and radioactive waste management. Due to the specificity of implemented activities, the safety of workers is connected to general factors, which may be found in every workplace, and to the radiological protection related to the specific operations carried out in areas with radiological risks.

Plan to improve the health and safety in the workplace

In 2018, the following actions of 2017 safety improvement plan have been implemented:

1. **Communication:** Standardisation of the information booklets and leaflets for the visitors of the Productive Units. These booklets explain the correct behaviours to follow while visiting the facility, and, especially, in case of conventional and radiological emergencies. Publication of safety bulletins in the corporate intranet, with news and updates concerning national and European regulatory frameworks, court decisions and news in the field of health and safety in the workplace.
2. **Safety Image:** attention to the safety image is important to keep high the level of awareness among workers. Notably, vertical and horizontal road signs maintenance is of paramount importance. For this reason, road signs, clothing and helmets have been adapted to corporate standards.
3. **Safety Culture:** dialogue with workers followed by “Safety walks”, carried out by safety managers within the Productive Units to assess the compliance with adopted health and safety measures and to assess improvement actions.

Training courses have been implemented for workers and managers on the topic of safety culture.

The Company still adheres to the “PRINT” memorandum of understanding, ratified with the other companies of the electric sector (Enel, TERNA, Edison, etc.) to define the actions to be implemented in case of regulatory updates and procedures to adopt in the event of electric risk.
4. **Information and Training:** training sessions to raise the management awareness on the topics of health and safety, and training cycles on good practices and management of materials containing asbestos and glass fibres. Within the field of a constant update on health and safety, courses have been organised to train and update the operators of the Emergency Teams. On these occasions, the topics of

first aid measures and management of emergency events have been also investigated.

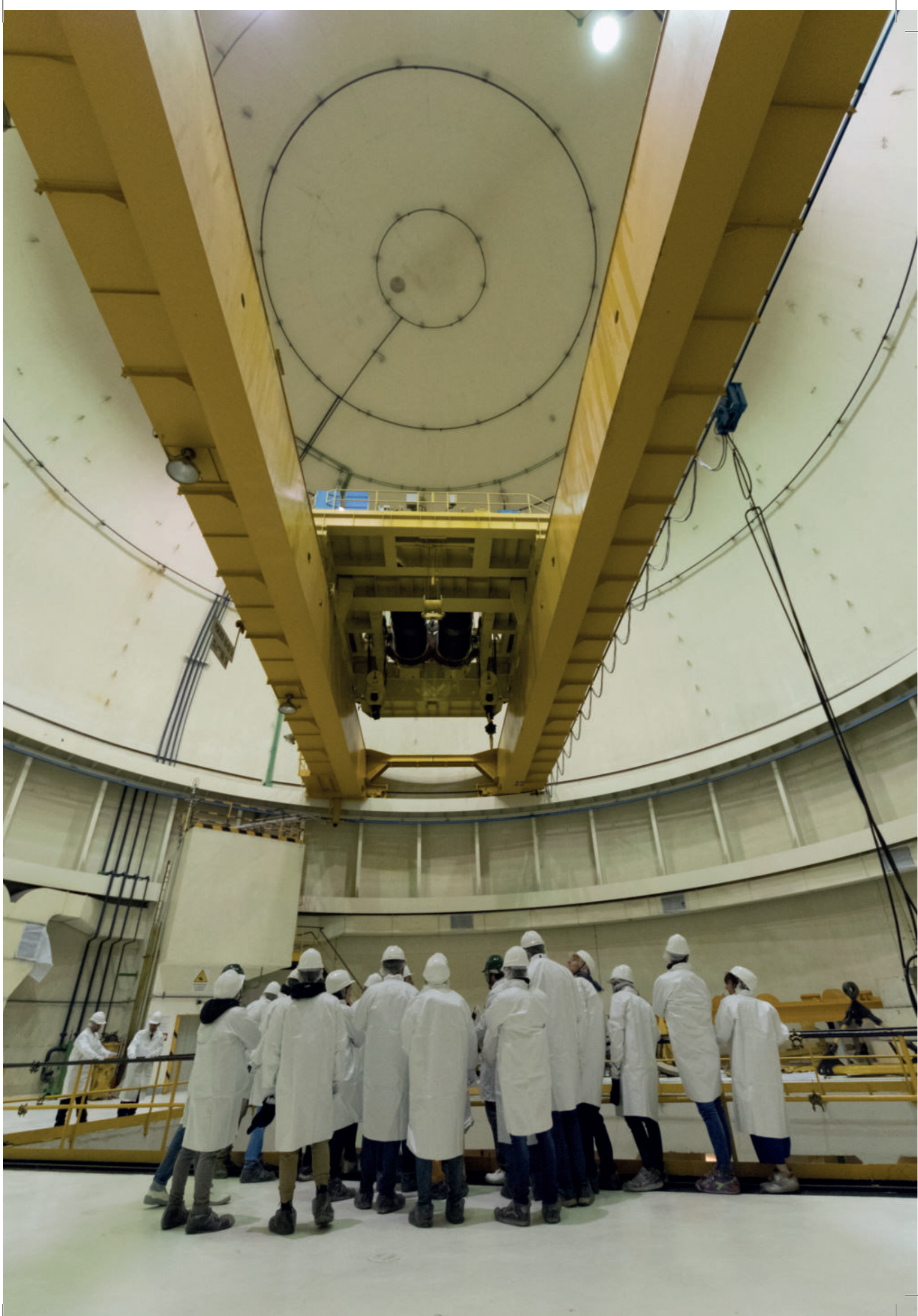
5. **Monitoring:** health and safety performances are monitored through a set of indicators, measured on a regular basis. Statistical indicators on Sogin work injuries and Sogin contractors’ injuries are measured on a monthly basis.
6. **Corporate Standardisation:** discussions and meetings have followed among people in charge for prevention and protection (RSPP), safety coordinators during execution (CSE) and corporate safety on the methodologies adopted for risk assessment and on implemented or planned prevention and protection measures.
7. **Safety Management Computerisation:** The Company continued the implementation of a software for the sites’ health and safety management, especially in terms of equipment, machine and plant maintenance, management of personal protection equipment, assessment of chemical risk for health and safety, and injury management. Moreover, a central system is active on Sogin common platform for the distribution of Personal Protection Equipment, that ensures time and cost efficiency and product quality in terms of compliance with applicable laws.
8. **Contractors’ Safety:** a qualification and monitoring process is guaranteed on Contractors’ safety and health performance, to improve safety levels in the contract execution.

Moreover, in 2018, further actions were added to the plan, some of them have been launched, while others are planned; these interventions include: counteractions against smoke, alcohol, drug abuse; healthy diet; lifestyle; work-life and corporate wellbeing.

Sogin has also joined INAIL events on health and defined food protocols for meal services. In addition, improvement actions were implemented on the products supplied by automatic vending machines.

Conventional Safety

In 2018, as in the two previous years, no cases of occupational diseases have occurred between Sogin Group employees and employees of supplier companies.



Injury Rate: it is the number of injuries with absence of work of at least one day divided by the hours worked over the year multiplied by 200,000 (equal to 50 working weeks of 40 hours for 100 employees).

Lost Day Rate: it is the ratio between the days not worked for injury and the hours worked over the year, multiplied by 200,000. The days not worked are calendar days calculated from the day the injury has occurred.

Absentee Rate: the number of days of absence due to illness, strike, injury on the number of worked days in the same period (multiplied by 200,000).

Injury indicators of Sogin employees ²¹

Interval	2018			2017	2016
	Total	Women	Men	Total	Total
Number of injuries among employees	9	2	7	10	15
Rome headquarters	3	1	2	4	7
Caorso	1	0	1	0	1
Latina	0	0	0	2	0
Trino	0	0	0	1	1
Garigliano	1	0	1	1	1
Bosco Marengo	0	0	0	0	0
Casaccia	2	0	2	1	5
Saluggia	2	1	1	1	0
Rotondella	0	0	0	0	0
Injury Rate²²	1.31	1.16	1.36	1.44	2.08
Worked Hours	1,369,730	344,017	1,025,713	1,392,710	1,444,721
Lost days due to injuries	163	46	117	279	315
Lost Day Rate²³	23.80	26.74	22.81	40.07	43.47

Absentee Rate in Sogin ²⁴

Interval	2018			2017			2016
	Women	Men	Total	Women	Men	Total	Total
Absentee Rate	8.1	3.6	4.9	8.0	4.5	5.4	-²⁵

Injury indicators of Nucleco employees ²⁶

Interval	2018			2017	2016
	Total	Women	Men	Total	Total
Number of injuries among employees	3	0	3	2	4
Injury Rate²⁷	1.8	-	2.11	1	2
Worked Hours	333,691	48,776	284,915	342,062	340,535
Lost Days due to Injuries	188	0	188	24	47
Lost Day Rate²⁸	113	0	132	14	27.6

Absentee Rate in Nucleco ²⁹

Interval	2018			2017			2016
	Women	Men	Total	Women	Men	Total	Total
Absentee Rate	8.1	6.5	6.8	7.8	6.0	6.3	-³⁰

21 Injury rates take into account the total number of accidents occurred over the reporting period, and during the performance of the job. From 2018 financial year 2018, injury rate also include accidents and events that resulted in 3 days of absence from work for which a notification was submitted to INAIL, following the INAIL Circular Letter No. 42 of 12 October 2017. Such obligation was previously fulfilled only in cases of injuries resulting in more than 3 days of absence from work.

22 Injury Rate: it is the ratio between the number of injuries with absence from work of at least one day and the number of worked hours over a year, multiplied by 200,000 (equal to 50 working weeks of 40 hours for 100 employees).

23 Lost Day Rate: it is the ratio between the days not worked for injury and the hours worked over the year, multiplied by 200,000 (equal to 50 working weeks of 40 hours for 100 employees).

24 Absentee Rate: from the financial year 2018, this rate is calculated as the ratio between the days of absence and the workable days over the year, multiplied by 100.

25 From 2017 the calculation method was changed and the comparison with 2016 was removed.

26 Injury rates include the total number of accidents occurred over the reporting period, both commuting and in the workplace.

27 Injury Rate: it is the ratio between the number of injuries with absence from work of at least one day and the number of worked hours over a year, multiplied by 200,000 (equal to 50 working weeks of 40 hours for 100 employees).

28 Lost Day Rate: it is the ratio between the days not worked for injury and the hours worked over the year, multiplied by 200,000 (equal to 50 working weeks of 40 hours for 100 employees).

29 Absentee Rate: from the financial year 2018, this rate is calculated as the ratio between the days of absence and the workable days over the year, multiplied by 100.

30 From 2017 the calculation method was changed and the comparison with 2016 was removed.

Injury Indicators of Sogin Contractors³¹

Interval	2018			2017	2016
	Total	Women	Men		
Number of injuries among contractors	8	0	8	1	2
Rome Headquarters	0	0	0	0	0
Caorso	1	0	1	0	0
Latina	0	0	0	0	0
Trino	1	0	1	0	1
Garigliano	0	0	0	1	1
Bosco Marengo	0	0	0	0	0
Casaccia	0	0	0	0	0
Saluggia	1	0	1	0	0
Rotondella	5	0	5	0	0
Injury Rate ³²	1.75	0	1.98	0.25	0.45
Worked Hours	912,443	106,081	806,362	803,651	887,801
Lost Days due to Injuries	114	0	114	10	58
Lost Day Rate ³³	24.99	0	28.28	2.5	13.1

Radiological Safety

Decommissioning and radioactive waste management operations are carried out according to specific rules and regulations aimed at guaranteeing the radiological protection of employees, people and the environment, in line with the highest standards of nuclear safety. The potential radiological impact resulting from usual operations is constantly monitored under the Legislative Decree 230/1995 and subsequent amendments and integrations, through specific environmental and physical surveillance systems.

The following tables summarise the radiation doses of the exposed employees of Sogin sites. The reported doses have been defined by the Qualified Expert.³⁴

The limit on the effective dose for workers' exposure is 20 mSv/year and it includes dose contributions from external radiations and internal contamination. The results of the physical surveillance on the employees working in Sogin sites are under the limits set out in the Legislative Decree 230/95 and subsequent amendments and integrations.

Maximum effective individual dose Sogin – Calendar year 2018

Site	Maximum Effective Individual Dose	Type of Exposure
	mSv ³⁶ /year	External or internal radiations ³⁷
Caorso	0.28	External
Latina	0.73	External
Trino	0.50	External
Garigliano	1.60	External
Bosco Marengo	0.20	External
Casaccia	0.50	External
Saluggia	0.35	External
Rotondella	1.0	External

Maximum individual doses Nucleco and Outside Firms – Calendar Year 2018

M.u.	Maximum Effective Individual Dose	Type of Radiation (External-Internal)
	Dose	mSv/year
Nucleco (max. individual dose)	2.7 mSv	
Nucleco (collective dose)	177 mSv*person	Total: 216 employees classified as Exposed per year, of which 211 are Exposed A and 5 are Exposed B (in some cases the exposure period does not refer to the whole year)

31 Injury rates include the total number of accidents occurred over the reporting period, both commuting and in the workplace.

32 Injury Rate: it is the ratio between the number of injuries with absence from work of at least one day and the number of worked hours over a year, multiplied by 200,000 (equal to 50 working weeks of 40 hours for 100 employees).

33 Lost Day Rate: it is the ratio between the days not worked for injury and the hours worked over the year, multiplied by 200,000 (equal to 50 working weeks of 40 hours for 100 employees).

34 A Qualified Expert is the person appointed by the employer to ensure the health surveillance of employees and the radiological safety of people and environment. He/she works in concert with the competent doctor who guarantees the workers' health surveillance on behalf of the employer.

35 The maximum effective individual dose is the dose absorbed by the exposed employee, which, due to the work performed over the year in the abovementioned site, was exposed to a greater exposure resulted from the sum of external and internal radiations.

36 A Millisievert (mSv) equals 0.001 Sievert (Sv). The Sievert is a derived unit of the effective dose, which results from the absorbed dose calculated on the type of incident radiation and the specific irradiated organ and/or body tissue, and it is used to calculate the biological effects of the exposure to ionizing radiations.

37 External radiation is produced by radiation sources that are external to the body, while internal radiation is caused by direct contamination of the body with radiological substances, ingestion, inhalation and/or dermal absorption.

Industrial safety

In line with current regulations and best international practices, Sogin manages nuclear and industrial safety for the following purposes:

- Protection of people and corporate assets;
- Physical protection of installations, materials and activities;
- Management of information, installations, technologies and materials under secrecy classification;
- Management of critical infrastructures subject to specific protection measures for reasons of public safety, order and civil protection;
- Mandatory training for employees with security clearance, on classified information and nuclear security, in partnership with institutions, public bodies, universities and research institutes.

As far as the industrial security is concerned in terms of nuclear security and the prevention measures adopted with the implementation of new IT technologies, Sogin has introduced an information safety management model, based on the ISO 27001 standard for the protection of corporate IT assets and management of cyber risks.

After having contributed to its design, Sogin has adopted and contextualised the national cyber security framework

based on the NIST model “Framework for Improving Critical Infrastructure Cybersecurity”, developed by CIS-Sapienza and by the National Laboratory of Cyber Security in partnership with the Italian Department of Information Security (DIS - Presidency of the Council of Minister).

Sogin has appointed an internal SOC (Security Operation Centre) with a specific working team (CERT - Cyber Event Readiness Team) to protect the information corporate assets. This body has the defence capabilities to tackle illegal activities carried out against corporate assets.

In 2018, Sogin has also implemented training activities for safety staff, with eight seminars on “Safety management in the nuclear field”. Training was held in Rome headquarters and in the sites of Bosco Marengo, Rotondella, Latina, Casaccia and Garigliano.

In 2018 Sogin continued its collaboration with the International CBRNe (Chemical, Biological, Radiological, Nuclear and explosive), Master Courses of Tor Vergata University, under the guidance of the Radwaste Management School.



NUCLEAR SECURITY AND NUCLEAR SAFETY

The term nuclear security refers to the measures to prevent intentional malicious actions such as theft, sabotage, non-authorized access, illegal transfer, related to nuclear power plants, infrastructures and to the transportation, use and storage of radioactive materials.

Nuclear Safety, based on principles set out by the international, community and national laws, aims at protecting people, workers and environment from the harmful effects of ionizing radiations. Thus, it also includes measures to avoid accidental hazardous events (such as, the release of radioactive material from a plant).

SUPPLIERS

PROCUREMENT POLICIES

Sogin procurement policies comply with the “Code of Public Procurement” under Legislative Decree 50/2016 and subsequent amendments and integrations, the ANAC (Italian National Anti-Corruption Authority) guidelines and the principles enshrined in the Treaty on European Union on the protection of competition. In order to perform its activities, Sogin works with the best national and international Companies in terms of technology, know-how and specialisation.

Sogin procurement lies on two main principles:

- Guaranteeing the maximum involvement of operators from the reference market, in line with the principles of free competition, equal treatment and non-discrimination;
- Procuring high-tech works, services and supplies from highly qualified suppliers, by its priority access to the qualification system.

Through the introduction of the new Code of Procurement (Legislative Decree 50/2016) and the following Legislative Decree No. 56 of 19 April 2017, concerning “Integrations and corrections to the Legislative Decree No. 50 of 18 April 2016”, Sogin has already updated and changed, in 2017, its whole procurement procedure. This integration activity followed in 2018, with the introduction of the new IT purchase and procurement Sogin platform, accessible through the website sogin.it.

Transparency and Involvement

Sogin publishes and updates on its website sogin.it, the Procurement Plan, a document that collects all required information for the execution of tendering procedures. The Plan defines tendering times and costs, and it is available online to ensure that Companies and associations of undertakings are constantly updated on tendering procedures and to foster the qualification of suppliers.

In order to ensure a wide dissemination and information on the new qualification system and on Procurement, in 2018, Sogin held several meetings in partnership with relevant associations to involve interested stakeholders.

Over the year, Sogin also continued the implementation of a one-stop-shop for businesses, originally established in 2016, which provides support and information to the stakeholders involved in a qualification procedure.

Further information on purchase regulations, including qualification rules, invitations for tenders and relevant deeds that shall be published under art. 29 of Legislative Decree 50/2016 and subsequent amendments and integrations, is available online at sogin.it. Sogin carries out its operations in tight connection with other businesses to create an Italian decommissioning chain, able to seize development opportunities connected with the closing of the nuclear cycle, a sector that will gradually grow in the next years.

Green Public Procurement

According to art. 34 of the Code of Public Procurement, contracting authorities shall contribute to the achievement of the environmental goals included in the action plan for Consumption environmental sustainability in the public administration; this, by including, among their tendering documents, all techniques and contractual terms encompassed by the minimum environmental criteria and adopted by Decree of the Italian Ministry for the Environment and Protection of Land and Sea.

Therefore, Sogin adopted specific guidelines to include the Minimum Environmental Criteria within the procurement documents. The guidelines were updated and reviewed in 2018 to promote the Green Public Procurement.

Green Public Procurement aims at fostering the dissemination of environmental technologies, the development of environmentally sound products and the establishment of a “green market”, not only to reduce environmental impacts, but also to promote sustainable production and consumption models.

E-procurement

To make the Procurement Process more efficient and to comply with the Code of Public Procurement, in 2017, launched the implementation of a new e-procurement system.

The new platform, operating from October 2018, allows the management of procurement procedures by computer, including the specific requirements of business areas, the execution stages of the contract (suspensions, extensions, variants), the qualification system for suppliers and the vendor rating. Economic stakeholders who want to take part in tendering procedures shall subscribe to the Purchase and Procurement portal.

Checks on the supply chain

In line with the best practices of the main Italian contracting authorities and in compliance with current regulations, Sogin accurately verifies the professional conduct of its economic stakeholders during qualification and tendering processes.

In application of the Legality Protocol, ratified in 2011 and renewed in 2016 between Sogin and the Prefectures of the Provinces involved in decommissioning operations (Alessandria, Caserta, Latina, Matera, Piacenza, Rome, Vercelli), the Company runs regular anti-mafia checks on its economic stakeholders involved in works, services, rentals, transportation or material supply.

At the end of the invitations to tenders, Sogin evaluates the adequacy of bids and, excludes, where possible, anomalous rebates which may affect labour costs, work quality and safety. Sogin requires suppliers, under qualification and awarding procedures, to comply with the rules of the Ethical Code according to which, Sogin shall not negotiate with economic stakeholders who failed to comply with safety regulations and other obligations required by labour relations. Similarly, Nucleco requires its suppliers to submit statements in which they recognise the Ethical Code principles, and refrain to engage in any behaviour that may induce the Company, its employees or collaborators, to breach such principles. Moreover, specific terms of the contract require:

- the supplier to submit a self-certification of compliance with specific social obligations (such as, measures ensuring the respect of the workers' fundamental rights, the principle of equal treatment and non-discrimination, the protection of working minors etc.);
- the chance for Sogin to run checks and verifications of the requirements declared in the operational units or in the operation headquarters of the supplying undertaking.

Shared Responsibility

Sogin regularly monitors its contractors and sub-contractors to verify their respect of workers' rights and the principles of social ethics and transparency, thus, limiting "shared responsibility of the purchaser" risk. To ensure the best work efficiency, Sogin operates an IT shared system which daily detects and monitors the presence of external workers under a procurement contract. Moreover, the Company runs massive checks on documents, aimed at assessing the correct fulfilment of payment, social security and insurance obligations on behalf of contractors and sub-contractors. This activity also includes sample checks performed on working sites.

QUALIFICATION SYSTEM

Since 2010, Sogin resorts to a qualification system to identify economic stakeholders to invite in tenders. Sogin qualification requirements reflect the guidelines set out by the National Anti-corruption Authority (ANAC). Subscription has an unlimited duration. This system is articulated in four categories: works; services and/or supplies; engineering services; services for the transportation of radioactive or special fissile materials. According to their expertise, stakeholders can subscribe to one or more categories (with a maximum of 5 categories for each bid).

The qualification system - partially implemented in 2017 and totally updated in 2018, in line with the ANAC requirements and integrations - is based on the principles of cost-effectiveness, fairness, equal treatment, advertising, transparency, quality, environmental protection and energy efficiency. From February 2018, with the implementation of ANAC integrations, after the introduction of the Code of Public Procurement, the Company has updated and simplified its qualification rules.

In the event of non-compliance on behalf of the contractor and/or the sub-contractor, the contracting authority, Sogin, launches substitution procedures, upon official request of the concerned parties, and directly provides the employee with the payment of the accrued amounts not paid by the contractor or sub-contractor.

Vendor rating

The vendor rating process aims at analysing and improving the suppliers' performance, by allowing greater transparency between the contracting authority and the contractor. This process provides for the performance of checks on all ratified contracts by Sogin, excluding those whose amounts are less than EUR 10,000, professional assignments of trustee nature to self-employed professionals, subscriptions, rents, utilities, sponsors and collaborations with bodies and institutions. The evaluation is based on the following parameters: compliance with specific technique, flexibility and promptness, staff expertise, adequacy of means and equipment, compliance with implementation time and general performance evaluation. Further parameters, such as work safety and environmental management, were also included in the process.

In case the supplier' performance is not satisfactory, there may be consequences in terms of qualifications - or for the ratification of future contracts with Sogin. Negative assessments may result in the exclusion of a - qualified or non-qualified - supplier from future invitations to tenders, and in the rejection of possible qualification requests.

In 2018, the vendor rating process management procedure was changed to comply with current operative modalities, the new Code of Public Procurement and ANAC updated guidelines.

The register was regulated by a specific documentary system, which includes a general guide and a set of qualification specifications divided by procurement type. Specific procedures have been implemented, specifically:

- **Specification for Work qualification** up to class 8 conventionally established in EUR 20,658,000;
- **Specification for Services qualification** up to EUR 25 million;
- **Specification for Supply qualification** up to EUR 10 million;
- **Specification for Engineering Services qualification** up to EUR 3 million.

In 2018, Sogin opened public procurement procedures for an economic value of 45.5% according to its requirements.

197 invitations to tenders were sent for a total amount of EUR 62.36 million.

130 contracts were ratified for a total amount of EUR 29.6 million, through qualified stakeholders.

Sogin – Figures of tenders and contracts under the qualification system - 2018

Nr. of tenders of the register	EUR (million)	Nr. Ratified contracts of the register	EUR (million)
197	62.36	130	29.6



VALUE OF ISSUED ORDERS AND GEOGRAPHICAL DISTRIBUTION OF SUPPLIERS

Decommissioning and waste management activities generate value for the territory, by contributing to the development of the local business fabric. The tables below report the absolute and percentage value of the orders issued by Sogin, divided by type of contract and geographical area, and the percentage distribution of awarded values (2016, 2017, 2018) calculated in regions hosting nuclear sites. As for Nucleco, the geographical distribution of suppliers is reported with the correspondent percentage share of expenditure on total

purchases of 2018. The contract ratified with JAVYS (Slovakian Republic) for the incineration treatment of solid and liquid waste is included among the contracts ratified with foreign companies, for an amount of EUR 6,909,550.

The value of this contract, equal to 40% of Nucleco orders in 2018, affects the percentages of other amounts. The table does not include the service contract Sogin-Nucleco, equal to EUR 1,910,265.00.

Value of the orders issued by Sogin divided by type

Type	2018	2017	2016	2018	2017	2016	2018	2017	2016
	EUR (Million)			%			Nr. of orders		
Supplies	19.3	19.2	17.1	16.8	9.7	16.9	180	177	130
Works	15.3	56.2	33.5	13.4	28.4	33	47	74	33
Services	80 ³⁸	122.7 ³⁹	50.9 ⁴⁰	69.8	61.9	50.1	495	504	364
Total	114.6	198.1	101.5	100	100	100	722	755	527

Value of the orders issued by Sogin divided by site

Site	2018	2018	2017	2017	2016	2016
	EUR (Million)	(%)	EUR (Million)	(%)	EUR (Million)	(%)
Bosco Marengo	4.1	3.1	7.1	1.3	0.9	0.8
Caorso	7.6	5.8	23.6	4.2	13.5	12.3
Casaccia	9.1	6.9	15.7	2.8	6.7	6.1
Garigliano	16.3	12.3	23.7	4.2	12	10.9
Latina	7.6	5.7	25.7	4.6	30.6	27.8
Saluggia	13.7	10.4	9.3	1.6	6.4	5.9
Rome						
Head-quarters	56.2	42.6	405.6	72	33.5	30.5
Trino	9.0	6.8	39.9	7	2.9	2.6
Rotondella	8.3	6.3	12.9	2.3	3.4	3.1
Total	131.9	100	563.5	100	109.9	100

Geographical distribution of suppliers - Sogin

Reference geographical areas	2018	2017	2016
	%		
Lazio (Casaccia, Latina, Headquarters)	56	79	65
Campania (Garigliano)	10	4	11
Piemonte (Saluggia, Trino, Bosco Marengo)	25	10	9
Emilia Romagna (Caorso)	9	4	12
Basilicata (Rotondella)	1	3	3
Total	100	100	100

³⁸ Net of EUR 17.3 million related to nuclear fuel.

³⁹ Net of EUR 365.4 million related to nuclear fuel.

⁴⁰ Net of EUR 8.4 million related to nuclear fuel.

Nucleco – Geographical distribution of suppliers - 2018

Reference geographical area	Number of contracts	Amounts (EUR)	Amounts %
Lazio	60	3,650,456.01	20.57%
Campania	5	435,150.00	2.45%
Piemonte	6	386,747.00	2.18%
Emilia Romagna	5	218,501.00	1.23%
Basilicata	9	711,293.38	4.01%
Lombardia	39	3,684,151.17	20.76%
Toscana	3	521,950.00	2.94%
Liguria	4	230,809.00	1.30%
Sicilia	1	20,000.00	0.11%
Puglia	6	285,367.68	1.61%
Umbria	3	77,331.00	0.44%
Veneto	2	49,900.00	0.28%
Marche	3	561,140.00	3.16%
Foreign Countries	3	6,912,927.00	38.96%
Total	149	17,745,723.24	100.00

5

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**CIRCULAR
ECONOMY
IN NUCLEAR
DECOMMISSIONING**

CIRCULAR ECONOMY STRATEGY

While performing nuclear power plants' decommissioning and safe maintenance activities, Sogin has constantly committed in minimising produced waste and maximising the recovery of materials.

The materials resulted from Sogin operations can be divided into two types: materials without radiological restrictions (conventional) and materials with radiological restrictions (radioactive).

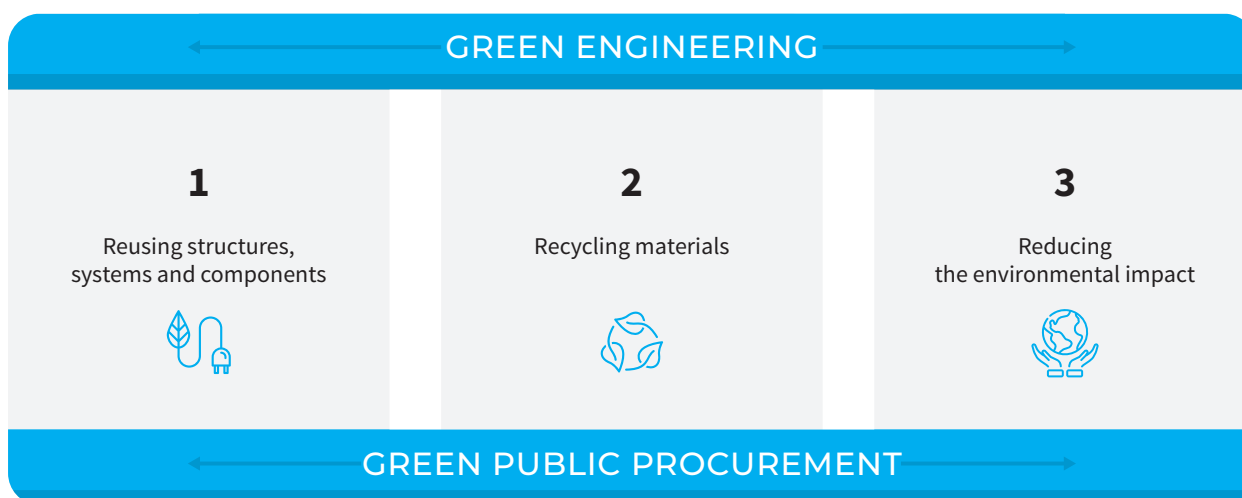
As for radioactive materials, characterisation campaigns have been launched which include further decontamination actions to minimise radioactive waste and maximise the quantity of releasable materials to be sent for recovery, in line with the specific circular economy strategy of this field.

The concept of circular economy is enshrined in Sogin mission and its nuclear decommissioning and radioactive waste management. Circular economy strategies are adopted in several corporate processes, from the design to the procurement stage.

Sogin circular economy strategy for nuclear decommissioning encompasses three main drivers:

1. Reusing structures, systems and components;
2. Recycling materials;
3. Reducing the environmental impact.

Full implementation of these 3 drivers requires the adoption of green engineering and green public procurement policies.



REUSING STRUCTURES, SYSTEMS AND COMPONENTS

Safe maintenance, radioactive waste management and nuclear decommissioning activities, up to the *interim state* stage, are performed by Sogin in the same industrial area of the plants. Despite some management and operation difficulties, this allows to reset the consumption of soil while avoiding an alteration of biodiversity in these areas. In some cases, Sogin has even transferred pieces of its land to foster regional development (e.g. the new Terna electric power plant and Latina photovoltaic plant). In many cases, the intended use of the buildings of decommissioning sites has been changed, by carrying out renovation works on structures and plants. This allowed reusing pre-existing buildings for new decommissioning and radioactive waste management operations.

For example, some areas of the turbine buildings of Caorso and Garigliano nuclear power plants, were intended for

building new material and waste management facilities. This choice led to a reduction in radioactive and conventional waste produced, in the need of building new structures, and, thus, of using new raw materials; it also led to a greater integration between the material treatment process and the decommissioning operations implemented in the nuclear island. Such integration strongly reduces workers' radiation exposure, potential contamination risks and, consequently, environmental impacts. In both cases, the reactor buildings will be connected to the waste and material management facilities by small civil infrastructures (connecting channels).

In Sogin sites under decommissioning, the adaptation of pre-existing buildings allowed the creation of radioactive waste interim storage areas without having to build new structures.

Recovery operations for the following structures have been planned, and, in some cases, already implemented: part of the turbine building in Caorso nuclear power plant; the former diesel and compactor of Garigliano nuclear power plant; the former hot cells of Casaccia OPEC 2 facility; the test tank area of Trino nuclear power plant; some premises of the reactor building in Latina nuclear power plant etc. In order to optimise its resources, Sogin has designed movable components, especially handling systems, that may be used to carry out the same operations in different sites. For example, roller conveyors have been recovered from the liquid radioactive waste extraction and conditioning plant of Garigliano site (GECO plant) to be reused in Latina nuclear site (LECO plant).

Another example is the movable super-compactor purchased to treat compactable materials resulted from Sogin nuclear plants (especially, Latina and Garigliano plants), thus, avoiding the purchase of different super-compaction systems, saving raw materials and reducing environmental impacts.

Through this approach, Sogin green engineering has also designed a modular waste conditioning station, called SiCoMoR, that may be easily carried to the different sites in iso-containers, a strategy that transformed the implementation of a radioactive waste management plant into a service.

These actions ensure an overall optimisation in terms of technological systems, use of raw materials and amounts of waste produced from decommissioning.

RECYCLING MATERIALS

Most of the structures in a nuclear power plant are free of radiological restrictions, due to the lack of original contamination or to decontamination actions.

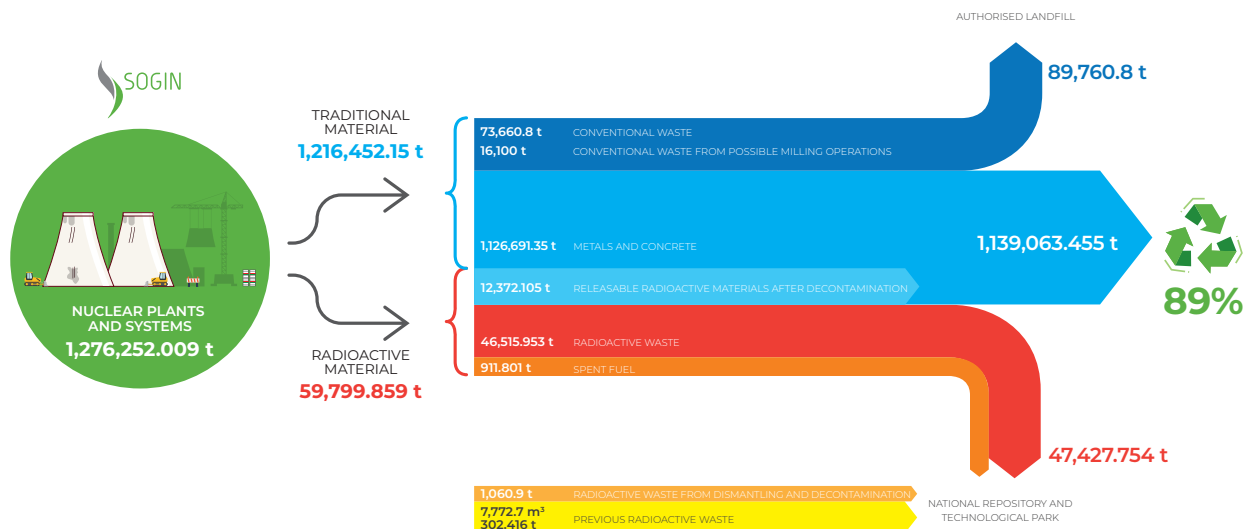
Once separated from radioactive substances, materials such as copper, iron and concrete, are reused or sent for recovery. When materials are divided by type, it is possible to plan their re-use in-situ. This happened with the dismantling of Caorso Off-gas Building or with Garigliano Trenches. In the first case, the **demolition of civil infrastructures of the Off-Gas building in Caorso nuclear plant**, previously hosting waste gas treatment systems, resulted in approx. 7,200 tonnes of (non-radioactive) concrete. Such material was partly re-used to fill the excavations resulted from the dismantling of the underground systems (former hold-up) adjacent to the building.

In the second case, the materials resulted from the dismantling of **Garigliano trenches**, the underground

storage facilities of low and very-low level waste, were re-used on site. Moreover, the excavation works implemented to recover radioactive waste produced great amounts of soil, that were later re-used to refill the trenches. In both cases, radiological tests, soil screening and actions to reduce the volume of dismantling leftovers were implemented before reusing the material.

The recovery of decommissioning materials was often carried out: for example, in the case of materials resulted from the dismantling of the turbo-alternator. In the four nuclear power plants these components, primarily consisting of iron, copper and plastic, have been sent to recovery and manufacturing facilities, such as foundries, to be later reintroduced in the production cycle.

The dismantling of the eight nuclear sites will allow recycling more than one million tonnes of materials and waste, equal to 89% of total dismantled materials.



REDUCING THE ENVIRONMENTAL IMPACT

The dismantling of nuclear power plants and facilities involves decontamination techniques and treatment of radioactive materials to significantly reduce the production of radioactive waste and the exploitation of raw materials. In the nuclear power plants of Trino and Caorso, for example, an in-line decontamination was carried out on the primary circuit; such operation led to a significant reduction of the amount of waste resulted from dismantling operations and to a reduction of radiation exposure for workers. As for the primary circuit of Trino nuclear power plant, a detailed plan of radiological characterisation was designed to use decontamination procedures to minimize radioactive waste. In this way, the remaining materials will be treated as recoverable conventional waste.

As for the vessel in Garigliano nuclear power plant, waste prevention and waste minimization strategies are currently under development. Specific cutting techniques will be adopted for vessel components and reactor internals to minimize secondary waste production; a cutting plan was also designed to reduce the number of final containers (from 21 to 12 containers).

Since there are no authorised foundries in Italy for the treatment of radioactive metallic materials, Sogin has identified, through a public procurement procedure, an international foundry able to decontaminate weakly contaminated materials coming from Garigliano, Latina and Trino nuclear power plants. Thanks to this action, the volume of radioactive waste to be disposed will be reduced by 3 times (from 1,381 cubic metres to 515 cubic metres). Recovered metals will be then recycled.

Minimization of radioactive waste is also carried out through innovative processes for the conditioning of liquid radioactive waste. For this reason, a new formula, which is now under qualification, will be adopted in the implementation of the CEMEX Complex of the Saluggia site, and it will improve the creation of final products with a 5% reduction in their final volume, equal to more than 80 casks with a capacity of 500 lt. To create the best conditions for applying the three abovementioned drivers, Sogin constantly commits in the adoption of green engineering and green procurement procedures.

In addition to complying with all the security standards in terms of nuclear installations, Sogin has always prioritised the adoption of controlled technological production processes in all its projects and fields, aimed at minimizing environmental impacts and risks. This engineering approach may still be improved through a wider optimisation of decommissioning processes and waste management procedures (among different sites), to reach a higher level in green engineering.

As for the green procurement, described in the previous chapter on suppliers, Sogin voluntarily decided to include the principles of Minimum Environmental Requirements in its procurement procedures.

Finally, to ensure that decommissioning activities are carried out by qualified stakeholders, Sogin is equipped with a qualification system for economic stakeholders which requires the latter to be certified UNI EN ISO 14001, or registered to EMAS or to submit relevant documents to certify the adoption of an environmental management system.



6



I ENVIRONMENT

ENVIRONMENTAL RADIOLOGICAL PROTECTION

Each year, Sogin carries out hundreds of samples and measurements, based on a specific radiological environmental monitoring in each site. This aims at ensuring a regular control of the radioactivity level in the environmental matrixes (atmosphere, surface water, underground water, soil and grass, sediments, soil depositions) and in the food matrixes (meat, fodder crops, fish and eggs).

Monitoring is implemented through environmental and radiological surveillance networks, installed in each nuclear power plant since its building, and according to the relevant matrixes and the frequencies of sampling and measurement. Over the years, these networks have been checked and adapted according to the local environmental conditions and the different configuration of the plants. Radiological monitoring aims at:

- Checking the main radiological means of contamination;
- Monitoring the radiological impact on environment and food chains in order to evaluate the dose for the

population, namely for specific groups that are potentially exposed to ionizing radiations resulting from the project activities;

- Verifying the compliance with the limits/reference levels set out by the current law and the respect of values of the specific discharge procedure applied in each site;
- Promptly notifying possible environmental impacts or possible health consequences on people.

The kind and frequency of sample and measure reported in the monitoring programme are previously communicated and authorised by the Regulatory Body (ISIN), which receives an annual information report on the environmental radiological condition. Meanwhile, ARPA Agencies (Regional Agency for the Protection of the Environment) carry out a similar monitoring and surveillance activity.

RADIOLOGICAL RELEASE PROCEDURES

Through the environmental and radiological monitoring, Sogin monitors the compliance with limits and/or reference levels under the current legislation and endures the values are in line with those of the specific release procedure in use in each site.

Release procedures define the maximum level of radioactivity that can be discharged by a specific plant over a calendar year, according to the provisions set out by the regulatory body.

As for Trino, Caorso, Garigliano and Bosco Marengo sites, such procedures are defined in the Ministerial Decommissioning Decrees, under art. 55 of Legislative Decree No. 230 of 1995, and they are based on the principle of non-radiological relevance, namely an effective dose of 10 micro sievert/year for the population.

Latina, Casaccia, Saluggia and Rotondella sites apply the release procedures set out under their operating licenses, and further provisions defined by the regulatory body. In these sites, the approval procedures for decommissioning is still ongoing, and it will update implemented release procedures.

The maximum quantity of liquid and gas effluents to be discharged is defined in line with a non-relevant radiological

effective dose on the population, in other words, the discharge procedure may be 100% implemented without significant impacts on environment and population. The release formula is defined according to several factors: the nature of the operations carried out in the plant, the fluctuation range of natural radiations, the critical routes of exposure (how the released radioactivity can be reabsorbed by the population, such as by ingesting the fish of the river or by eating vegetables from local crops, which are part of the food chain).

Formulas are regularly updated according to the new regulatory standards on radiological protection and nuclear safety and following the changes in the plant's configuration. In all Sogin sites, the annual implementation of release formulas results in some percentage points, thus, impacts on the population and the environment are not significant from a radiological viewpoint.

Further details on the release formulas implemented in each site are available at sogin.it.

Nucleco also regularly monitors the quantity of released gas and liquid effluents, in line with the release formula stated under the operating license. The effective dose of the most exposed individual among the population, resulted from the total of gas and liquid effluents, is lower than 10 micro Sievert/year.

Implementation of release formulas in Sogin

	2018	2017	2016
Site		Gas - % use	
Caorso	0.02	0.03	0.03
Latina	< 0.10	0.013	< 0.01
Trino	1.23	0.44	2.01
Garigliano	0.02	0.02	0.01
Bosco Marengo	0.04	0.03	0.02
Casaccia	< 2.00	< 2.32	< 2.61
Saluggia			
<i>Alpha</i>	0.037	0.03	0.03
<i>Beta-gamma</i>	0.035	0.06	0.06
Rotondella			
<i>Particulate</i>	0.07	0.07	0.07
<i>Noble Gas</i>	4.19	3.97	3.76
Site		Liquid - % use	
Caorso	0.01	< 0.01	< 0.01
Latina	1.73	< 0.10	0.32
Trino	0.009	0.005	0.010
Garigliano	0.059	0.11	0.42
Bosco Marengo	0.45	0.21	0.27
Casaccia ⁴¹	n.a.	n.a.	n.a.
Saluggia	0.009	0.005	0.006
Rotondella	0.45	0.66	1.50

Gas and liquid release in Nucleco

	2018	2017	2016
		% use ⁴²	
Gas	<10	<10	<10
Liquid	2.8	2.4	5.4

41 No release formulas are available for liquid effluents, since they are sent to Nucleco.

42 Nucleco licenses do not include release formulas for gas effluents; licenses only set the release limit within a maximum dose of 10 micro sievert to the population, including both gas and liquid effluents. Since the amount of gas effluents is estimated around 1 micro sievert, the value 10% is reported.

RADIOLOGICAL MONITORING

The following tables report the concentration of radioactivity detected in the environmental and food matrixes, and the level of investigation (LI) calculated for each radionuclide in the selected matrixes. Sea water matrix is monitored by the surveillance networks of the plants which release liquid effluents into the sea (Latina and Rotondella).

The clean river water matrix is, instead, monitored by surveillance networks in plants that release liquid effluents in surface rivers (Caorso, Trino, Garigliano, Casaccia, Saluggia). In Bosco Marengo site, due to the nature of operations and plant, the uranium concentration is exclusively monitored, lower than the non-radiological relevance.

The outcomes of the environmental surveillance are compared with the reference levels expressed in terms of activity concentration in the specific sampled matrix, and they classified in:

- **Recording level**, value of radionuclide concentration in a specific matrix above the minimum detectable concentration (MDC);
- **Investigation level**, radioactivity concentration value over which further investigations should be implemented;
- **Intervention level**, radioactivity concentration level at which mitigative actions should be adopted.

Food Matrix – Milk – Sogin

M.U. Bq ⁴³ /litre	2018		2017		2016	
	Strontium-90	Caesium-137	Strontium-90	Caesium-137	Strontium-90	Caesium-137
Investigation Level	0.36	3.90	0.36	3.90	0.36	3.90
Caorso	0.017	<0.02	0.02	<0.02	0.02	<0.02
Latina	<0.04	<0.03	<0.03	<0.12	<0.03	<0.03
Trino	0.024	<0.10	0.01	<0.10	0.02	<0.10
Garigliano	<0.042	<0.012	<0.033	<0.015	<0.22	<0.02
Bosco Marengo	-	-	-	-	-	-
Casaccia ⁴⁴	n.d.	n.d.	0.0044	0.0168	0.0076	0.0188
Saluggia	<0.01	<0.12	0.015	<0.16	0.01	<0.19
Rotondella	0.03	<0.09	0.03	<0.15	0.05	<0.20

Environmental Matrix – Soil – Sogin

M.U. Bq/kg	2018		2017		2016	
	Total Uranium ⁴⁵	Caesium-137	Total Uranium ⁴⁶	Caesium-137	Total Uranium ⁴⁷	Caesium-137
Investigation Level	17,000 ppm	198	17,000 ppm	198	17,000 ppm	198
Caorso	-	3.15	-	3.47	-	5.32
Latina	-	-	-	-	-	-
Trino	-	12.5	-	17.5	-	16.6
Garigliano	-	5.20	-	5.11	-	3.48
Bosco Marengo	0.77	-	0.67	-	0.48	-
Casaccia	-	n.d.	-	3.63	-	5.81
Saluggia	-	9.07	-	14.5	-	14.8
Rotondella	-	1.98	-	2.98	-	2.80

⁴³ The unit used to measure radioactivity is the Becquerel equal to the activity of a quantity of radioactive material in which one nucleus decays per second.

⁴⁴ Figures of Casaccia site for year 2018 will be available after the publication of the ENEA Report (July 2019).

⁴⁵ Uranium concentrations are measured in parts per million (ppm).

⁴⁶ Uranium concentrations are measured in parts per million (ppm).

⁴⁷ Uranium concentrations are measured in parts per million (ppm).

Environmental Matrix – Sea Water – Sogin

M.U. Bq/litre	2018		2017		2016	
	Caesium-137	Strontium-90	Caesium-137	Strontium-90	Caesium-137	Strontium-90
Investigation Level	1.34	0.17	1.34	0.17	1.34	0.17
Caorso	-	-	-	-	-	-
Latina	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Trino	-	-	-	-	-	-
Garigliano	<0.014	-	<0.014	-	<0.014	-
Bosco Marengo	-	-	-	-	-	-
Casaccia	-	-	-	-	-	-
Saluggia	-	-	-	-	-	-
Rotondella	<0.020	<0.044	<0.020	<0.045	<0.020	<0.035

Environmental Matrix – Clean River Water – Sogin

M.U. Bq/litre	2018				2017				2016			
	Strontium-90	Caesium-137	Tritium	Cobalt-60	Strontium-90	Caesium-137	Tritium	Cobalt-60	Strontium-90	Caesium-137	Tritium	Cobalt-60
Investigation Level	0.17	1.34	326	0.72	0.17	1.34	326	0.72	0.17	1.34	326	0.72
Caorso⁴⁸												
downstream 1	-	0.00027	-	0.00012	-	0.00024	-	0.00013	-	0.00041	-	0.00066
downstream 2	-	0.00081	-	<0.0003	-	0.00017	-	<0.0003	-	0.00036	-	<0.0003
Latina												
Trino												
upstream	0.00013	<0.00024	< 1.1	<0.00021	0.00010	<0.00027	< 1.1	<0.00038	0.00008	<0.00024	< 1.1	<0.00023
downstream	0.00017	<0.00039	< 1.1	<0.00035	0.00098	<0.00221	< 1.1	<0.00183	0.00047	<0.00024	< 1.1	<0.00021
Garigliano												
upstream	-	<0.0132	-	<0.00864	-	<0.0141	-	<0.00973	-	<0.0136	-	<0.00866
downstream	-	<0.0132	-	<0.00864	-	<0.0141	-	<0.00973	-	<0.0136	-	<0.00866
Bosco Marengo⁴⁹	-	-	-	-	-	-	-	-	-	-	-	-
Casaccia	-	n.d.	-	-	-	<0.005	-	-	-	<0.005	-	-
Saluggia	-	<0.010	-	-	-	<0.011	-	-	-	<0.010	-	-
Rotondella	-	-	-	-	-	-	-	-	-	-	-	-

48 The values are equal to the average annual value between the concentration in solution and concentration in suspension, respectively measured in the discharge channel (downstream 1) and Isola Serafini (downstream 2). As stated under the surveillance programme, in place of the sampling station of Isola Serafini, which is currently out of service due to maintenance works of the bridge, since October 2018, another sampling station is implemented; the measured values of 137 Cs and 60 Co can be compared with the downstream concentrations of the plant's release point.

49 The water of Rio Lovassina are exclusively monitored for Uranium presence. The radioactivity concentrations measured downstream of the release point do not show anomalies compared to the upstream values and they are equal to 0.0001 Bq/l.

CONVENTIONAL ENVIRONMENTAL PROTECTION

In line with the current legislation on environmental impact, Sogin launches the necessary environmental procedures – Environmental Impact Assessment and/or the eligibility assessment under the second section of the Legislative Decree No. 152/06 and subsequent amendments and integrations – to verify possible environmental impacts of the operations performed in a nuclear power plant.

During 2018, Sogin submitted two requests for Caorso site: the request for a national Environmental Assessment for the project “Alternative Management of previous radioactive waste, through interim storage in specific areas of the site”; the request for a national environmental assessment for the project “Change of the permit for on-site interim storage (R13 e D15) for conventional, hazardous and non-hazardous waste”. Both procedures have resulted in an exclusion from the Environmental Impact Assessment.

To verify that environmental conditions are maintained during decommissioning and in line with the provisions of the ministerial decrees, Sogin regularly monitors the quality of environmental components (atmosphere, surface water, underground water, plants, animals, landscape and

noise) through a set of regular measurements carried out on selected biological, chemical and physical indicators. This procedure, called conventional monitoring, is carried out at variable intervals in the four nuclear power plants, in Rotondella ITREC site and in Saluggia EUREX site, according to the nature of the site, aiming at:

- Verifying the site complies with the impact estimated in the Environmental Impact Assessment report;
- Collecting data to report the environmental status and the decommissioning progress;
- Ensuring full control of the environmental situation in the different stages;
- Evaluating environmental developments by comparing ante-operam outcomes with ongoing outcomes and preparing corrective actions in case of anomalies.

Monitoring outcomes are regularly collected in an environmental report concerning the maintenance of environmental conditions and the progress of activities within the scope of the implemented environmental procedure; these outcomes are available on the RE. MO. (Monitoring Network) accessible through the website sogin.it.

REMEDIATION PROCEDURE

Where values above the threshold of contamination concentration are detected, during monitoring campaigns, in the soil and groundwater matrixes, Sogin launches a remediation procedure as stated under section IV of Legislative Decree 152/2006, which envisages the following:

- Communication of the detection of a possible contamination to other Bodies (launch of the remediation procedure);
- Drafting and delivery of the Radiological Characterisation Plan with a proposal of Investigation Plan, defined according to the preliminary conceptual model of the site (detection of the contamination source, migration paths, pathways of exposure and targets);
- Approval of the Radiological Characterisation Plan on behalf of the Conference of Services consisting of monitoring local entities (Region, Province, Arpa, Municipality, ASL- Local Public Health Unit);
- Implementation of the Investigation Plan aimed at verifying the drafted conceptual model and at collecting

input data for the Health Risk Analysis of the specific site to detect the Risk Threshold Concentrations;

- Approval of the Health Risk Analysis of the specific site on behalf of the Conference of Services and definition of subsequent actions: if the Risk Threshold Concentrations are exceeded, the executive remediation plan or the executive safe maintenance plan are prepared. If the Risk Threshold Concentrations are low, a monitoring plan is implemented to verify the development of the detected anomaly as proposed in the Health Risk Analysis Report of the specific site;
- If the Risk Threshold Concentrations are exceeded, the Executive Remediation Plan or the Executive Safe Maintenance Plan and monitoring plan are submitted;
- Approval of the Executive Remediation Plan or the Executive Safe Maintenance Plan on behalf of the Conference of Services;
- Implementation of the actions identified in the Executive Remediation Plan or in the Executive Safe Maintenance Plan;
- Implementation of the approved monitoring plan.

ONGOING REMEDIATION PROCEDURES

In 2018, the following sites are still involved in remediation procedures: Bosco Marengo, Caorso, Latina, Garigliano, Trino and Rotondella.

Bosco Marengo

In 2016, during a qualitative characterisation campaign performed on the ground water of the site, an exceedance in Threshold Contamination Concentrations of some carcinogen aliphatic and chlorinated compounds was detected: tetrachloroethylene, dichloroethylene and trichloromethane and chromium VI. This event resulted in the launch of a remediation procedure.

- In May 2016, the potential contamination of the site's ground water was communicated as stated under art. 245 of Legislative Decree 152/06 and following amendments and integrations.
- In June 2016, Sogin submitted the Characterisation Plan.
- In January 2018, Bosco Marengo Municipality approved the Characterisation Plan, integrated according to the requests of the Conference of Services, with resolution No. 2.
- From February 2018, field and laboratory investigations were launched as provided under the approved Characterisation Plan, for the collection of experimental data to draft the Risk Analysis for the specific site (to be submitted by 2019).

Caorso

In the framework of the monitoring activities on ground water launched in 2012, in October 2016, an exceedance in the Threshold Contamination Concentrations was detected for the PCB compound in a single sampling point located within a waterproof diaphragm. The detection of possible contamination within such diaphragm, as shown by the analysis carried out on the water samples taken from other sampling points outside the diaphragm, has ensured that the potential contamination did not spread.

- In October 2016, Sogin communicated the detection of a possible contamination in the site's ground water.
- In March 2016, due to the features identified during the confinement of a limited area affected by the contamination, a "Single Remediation Project" (document NP VA01196) was submitted to the competent bodies as stated under art. 249 of Legislative Decree 152/06 and subsequent amendments and integrations.
- In May 2017, the Conference of Services gave a favourable opinion on the "Single Remediation Project" and requested the integration of a detailed report on the waste resulting from the treatment.
- In December 2017, Sogin submitted the "Single Remediation Project" by providing that, as requested by the Conference of Services, ground water is reintroduced in the same geological unit.
- In January 2018, ARPA Emilia issued the approval of the Single Remediation Project, as previously integrated.
- In 2018, procedures were started to draft tendering documents, to build the treatment plant included in the approved Single Remediation Project.

Latina

In December 2013, during the environmental monitoring to assess the maintenance of environmental compatibility in the dismantling of Latina nuclear power plant (in line with provision A4 of the EIA Decree issued by the Ministry

for the Environment and Protection of Land and Sea DVA-DEC-2001-000575 of 27/10/2011), ground water were monitored through the piezometers located in the site. This measurement detected outliers in the concentration of vinyl chloride, which resulted in the launch of a remediation procedure.

- In January 2014, the possible contamination of the site's ground water was communicated under art. 245 of Legislative Decree 152/06 and following amendments and integrations.
- In February 2014, the Characterisation Plan was submitted.
- In March 2014, the Conference of Services ordered, pending the approval of the Characterisation Plan and the Health Risk Analysis of the specific site, the execution of a monitoring plan aimed at verifying the development of the detected potential contamination.
- In September 2014, with Municipal resolution No. 225/2014, the Characterisation Plan was approved, with the integrations requested by the Conference of Services.
- Between September 2014 and January 2015, the investigations provided in the approved Characterisation Plan were carried out.
- In February 2015, based on the outcomes of the field and laboratory analysis carried out in line with the Characterisation Plan, the Site-specific Health Risk Analysis Report was submitted to the Conference of Services.
- In December 2015, the Site-specific Health Risk Analysis Report was approved with resolution No. 2326.
- In January 2016, the outcomes of the analysis performed on ground water and sampled in the piezometers of the site were submitted to the Conference of Services. One of the investigated samples recorded a value of vinyl chloride concentration exceeding the Threshold Contamination Concentration.
- In March 2016, in order to clarify the detected anomaly, the Conference of Services requested the performance of detailed investigations in the area where the piezometer detected an exceedance in the Threshold Contamination Concentration, to be integrated in the Characterisation Plan approved in September 2014.
- In May 2016, the "Integration to the Characterisation Plan of ENEA 6 Area" was submitted.
- Between June 2016 and June 2017, further investigations of the detailed plan – ENEA 6 Area were performed, according to the requests of the competent bodies during a session of the Conference of Services held on 17 March 2016.
- In July 2017, an update of the Health Risk Analysis of the specific site was submitted, with pending approval on behalf of the Conference of Services.
- In 2018, following internal rearrangements of the competent bodies (especially Latina Municipality and ARPA Lazio), several meetings were held to define the procedure and activity developments.

Garigliano

During the environmental monitoring activities as stated under provision 1.7 of the environmental compatibility decree on decommissioning, an exceedance in the values of the Threshold Contamination Concentrations for some compounds detected in ground water: trichloromethane, fluorides and Methyl tert-butyl ether (MTBE), that resulted in the launch of a remediation procedure.

- In July 2014, the potential contamination of the site's ground water was communicated under art. 242 of Legislative Decree 152/06 and subsequent amendments and integrations.
- In August 2014, the Characterisation Plan was submitted.
- In January 2016 the Characterisation Plan was approved through Decree No. 8 of Region Campania. The performance of the investigations provided for in the Plan was subject to the ratification of a convention between Sogin and Arpa Campania, to perform a joint analysis on at least 10% of the samples taken.
- In July 2016, the convention between Sogin and Arpa Campania was ratified.
- Between January and March 2017, the planned investigations were performed, and, in July 2017, they were validated by ARPA Campania.
- In October 2017, the Health Risk Analysis Report on the specific site was submitted and approved with Decree No. 35 of 15/03/2018.
- In compliance with the approval No. 35/2018, monitoring activities are currently carried out on ground water; such activities will last two years (monthly in the first six months, and quarterly for the remaining period).

Trino

To identify the qualitative status of "ground water" before starting adaptation operations of the "Test Tank" into a temporary Repository, in September 2015, Sogin launched an environmental monitoring campaign. The laboratory analysis performed on ground water samples outlined some outliers in the concentration of metals, such as aluminium, arsenic, iron and manganese.

- In December 2015, the potential contamination of the site's ground water was communicated under art. 242 of Legislative Decree 152/06 and subsequent amendments and integrations.
- In January 2016, the Characterisation Plan was submitted to the Conference of Services.
- In May 2016, with resolution No. 287/568 of Trino Municipality, the Conference of Services approved the Characterisation Plan.
- In November 2016, Sogin requested an extension of the deadline to submit the Risk Analysis, since the contract with the company that had to perform the investigations was not ratified.
- Between May and September 2017, Sogin performed the activities provided for in the Investigation Plan.
- In December 2017, ARPA Piemonte validated the conducted analysis.
- In December 2017, the Risk Analysis on the surface soil matrix was submitted, and a quarterly monitoring on the ground water matrix was proposed for a duration of 12 months, to verify the concentrations of metals over time.
- In May 2018, the integration "Assessment of the chemical and physical features of the site's ground water. Data Analysis 2015-2017" was submitted to the Conference of Services.
- In July 2018, with resolution No. 362/749 of 13/07/2018 by Trino Municipality, the Health Risk Analysis for the specific site was approved, with integrations, by providing the quarterly monitoring of ground water for a two-year period. Moreover, an executive remediation project was

drafted for the contamination detected in the surface soil matrix around the hotspot called pZ18, concerning the copper compound.

- From July 2018, operations for the preparation of tendering documents and procedures have been launched to implement the monitoring of ground water.
- In November 2018, the Executive Remediation Project for soil matrix was submitted under the Legislative Decree No. 152/06 and subsequent amendments and integrations, approved with resolution No. 118 of 30/01/2019 by Trino Municipality.

Rotondella

In the framework of the monitoring plan prepared for the creation of the Final Product Cementation Plant, in compliance with the EIA Decree, during the first preliminary campaign, exceedances in the Threshold Contamination Concentrations of some chemical compounds (trichloroethylene, chromium VI, iron, total hydrocarbons) were detected in the ground water of ENEA site in Rotondella. Sogin communicated such anomalies to the competent bodies and launched the remediation procedure.

- In June 2015, Sogin and ENEA communicated the potential contamination of the site's ground water in compliance with art. 245 of Legislative Decree No. 152/06 and subsequent amendments and integrations.
- In July 2015, the Characterisation Plan was submitted to the Conference of Services.
- In December 2015, the Characterisation Plan was approved by resolution No. 855 of 14/12/2015 of Rotondella Municipality.
- In May 2016, due to delays in the procurement procedure for the execution of the investigations provided for in the Characterisation Plan, to be submitted to competent bodies within 6 months from the Plan approval, the implementation status of the activities was communicated, and an extension request was submitted.
- Between June and August 2016 and April and June 2017, field and laboratory analysis were performed according to the approved Characterisation Plan, validated by ARPA Basilicata in September 2017.
- In October 2017, a Conference of Services was summoned to analyse the outcomes of the performed investigations. Pending the drafting of the Site-specific Health Risk Analysis Report, actions to be promptly implemented have been defined: as for ENEA and Sogin, removing the tank and the pipeline of the Magnox plant (deemed as the contamination source); as for ENEA, in addition to the regular drainage and disposal of the piezometers' water in which the exceedance of Threshold Contamination Concentration was detected, the Company shall draft a report for the performance of further investigations aimed at creating other piezometers downstream the SS16, to verify the possible migration of the contamination outside the ENEA perimeter.
- From November 2017, ENEA provides, as stated by the Conference of Services, for the drainage of existing piezometers which present water samples with exceeding concentrations and for the disposal of the produced water.
- In January 2018, the Conference of Services approved the project for the removal of the tank and the pipeline of the

- Magnox plant, pending the approval of the activities on behalf of the Nuclear Regulatory Authority.
- In January 2018, ENEA and Sogin submitted the Site-specific Health Risk Analysis Report to the Conference of Services.
 - In April 2018, the Conference of Services approved the Site-Specific Health Risk Analysis Report with resolution protocol No. 001675 of 11/04/2018. In the same month, the Parma Public Prosecutor's Office implemented the preventive seizure of some plants of the ITREC site in Rotondella, related to the ground water draining trenches system, originally installed when the site was built and used to keep the underground nuclear structures under water heads, and the three collection tanks for potentially radiological industrial waste water.
 - Following the preventive seizure, the design operations for a water treatment plant were immediately launched, to ensure the site safe maintenance.
 - From May 2018, Sogin operated the ground water treatment plant to manage the water drained from the 5 draining wells, thus ensuring the nuclear safety conditions of the site.
 - Between May and June 2018, after the approval of the Conference of Services, ENEA implemented the new piezometers adjacent to road SS16 (barrier piezometers), whose waters were subject to drainage and disposal, to verify the possible migration of the contamination outside of the site.
 - In November 2018, ENEA submitted the executive remediation project for securing the site to the Conference of Services.



EMAS REGISTRATION

The EMAS (Eco-Management and Audit Scheme) is a scheme open to private and public companies, businesses and organisations eager to evaluate and assess their environmental performance. Through this instrument, an Organisation can voluntarily open a dialogue with the public, and publicly share information on its environmental performance also by publishing an environmental statement with environmental objectives, and yearly tracking and reporting its progress.

To maintain its EMAS registrations, Sogin should carry out an environmental monitoring, ensure the environmental legislative compliance of its activities and correctly apply the criteria enshrined in an Environmental Management System. All these aspects are yearly certified, together with the environmental statements, by an external accredited body.

As far as Caorso nuclear power plant is concerned, in April 2015, Sogin concluded the procedure of the EMAS regulation

(EC) No. 1221/2009 and subsequent amendments and integrations, and obtained the EMAS registration certificate, which recognises the complex environmental management system in the field of decommissioning.

A proof of the continuous improvement in environmental performance, as the main principle adopted in managing its activities, Sogin obtained the EMAS registration also for Trino nuclear power plant in October 2015 and for the EUREX plant of Saluggia in February 2017. Moreover, a procedure was launched for the registration of ITREC plant in Rotondella that is still ongoing.

In the first half of 2018, Nucleco environmental statement was completed and submitted for validation. Validation was obtained on 30 June 2018. The Company is currently waiting for the EMAS registration.

The environmental statements of the plants, certified with EMAS registration, are available on the website sogin.it.

Site/Plant	Certifications			EMAS Registration
	UNI EN ISO 9001	UNI EN ISO 14001	BS OHSAS 18001	
Trino	•	•	•	•
Caorso	•	•	•	•
Latina	•	•	•	
Garigliano	•	•	•	
Bosco Marengo	•	•	•	
Saluggia	•	•	•	•
Casaccia	•	•	•	
Rotondella	•	•	•	Started
NUCLECO	•	•	•	Started

PROMOTION OF GOOD ENVIRONMENTAL PRACTICES

Sogin promotes actions and projects among its employees to foster the promotion of good environmental practices.

One of the projects implemented is called **Sogin Plastic Reduction** and aims at reducing the use of single-use plastic objects in the workplace. During the plastic-free campaign of the Ministry of the Environment, each employee received a biodegradable eco-bottle to be used in place of plastic bottles and glasses. Another campaign will be launched in 2019, to raise awareness on the topic of plastic reduction. This is a way to promote sustainable habits among employees and to reach the waste minimisation objective, which is part of the Group's Circular Economy Strategy for nuclear decommissioning.

In addition to this, in 2018, the Company continued the implementation of a plan to **reduce CO₂ emissions**, through an energy saving programme and actions for sustainable mobility, in line with the European Climate-Energy Package and the best international practices.

Sogin also joined a programme launched by the Rome Public Transport Company aimed at reducing the use of individual cars in favour of public transport: in 2018, Sogin staff of Rome headquarters received 230 annual public transport tickets.

Neon lighting systems were replaced by led lighting systems in the headquarters and in the sites.

In Rome headquarters, from 2017, 20 bike racks and several vending machines for snacks and drinks (on free loan) were installed and resulted in 50% energy saving.

Finally, starting from 2017, Sogin started and promoted the separate waste collection. The action called "**Differenziamoci**" followed in 2018. Trash bins for separate waste collection are available in the eight sites and in Rome headquarters divided by plastic, paper and undifferentiated waste, as well as specific containers for the collection of empty toners.



7

I APPENDIX

ENVIRONMENTAL DATA

GRI 301-1: Consumed Materials						
Performance indicators	MU	Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Renewable Consumed Materials						
Paper	ton	23.72	3.86	27.58	25.0	25.2
Non-renewable Consumed Materials						
Metals	ton	200	61	261	1,057	1,752
	No. tanks	1,700	1,695	3,395	7,047	8,271
Machine Lubricants	l	1,613	330	1,943	1,240	6,465
Industrial Gases	m ³	96,691	588	97,279	104,144	79,989
Cement/concrete	m ³	1,142	-	1,142	4,842	5,780
	ton	-	158	158	50	105
Other	ton	1,590	93	1,683	255	3,518

Consumed Materials resulted from recycled materials (data limited to Sogin SpA)			
	Sogin 2018	Sogin 2017	Sogin 2016
Paper	92%	98%	91%

GRI 302-1: Energy Consumption of the Organisation (*)						
Performance Indicators	MU	Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Total Energy Consumption	GJ	163,783	3,179	166,963	177,609	168,537
Methane	GJ	13,324	2,486	15,810	16,273	16,083
Fuel	GJ	166	-	166	64	14
Diesel	GJ	32,623	693	33,316	35,024	33,583
Electric energy	GJ	115,114	-	115,114	123,317	116,447
Other	GJ	2,556	-	2,556	2,932	2,410

GRI 303-1: Water withdrawals divided by source						
Performance Indicators	MU	Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Total	m³	6,083,530	102,070	6,185,600 (**)	32,047,207	52,479,201
Aqueduct	m ³	42,465	-	42,465	42,459	22,502
Well	m ³	418,794	102,070	520,864	549,206	523,758
River	m ³	5,423,004	-	5,423,004	6,015,305	5,186,144
Sea	m ³	9,931	-	9,931	25,228,800	46,521,000
Ground Water	m ³	189,337	-	189,337	211,437	225,797

GRI 305-1: Greenhouse Gas Direct Emissions (Scope 1) (***)						
Performance Indicators	UdM	Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Greenhouse Gas Direct Emissions (Scope 1)	tCO ₂	3,793	190	3,983	3,599	3,213

(*) The consumptions in GJ were calculated through the conversion factors published by Ispra in the "National Standards Table" updated to 2018.

The electricity consumptions in GJ were calculated through the conventional factor (1 MWh equal to 3,6 GJ).

(**) The relevant reduction in water withdrawals is mainly connected to the sea water withdrawals recorded in Latina Nuclear Power Plant. Such variation is due to the gradual reduction in the remediation activities implemented on the pool containing radioactive material. This process, launched in 2016 and continued in 2017, involved the performance of remaining activities in 2018, for which no relevant water withdrawal was implemented.

(***) Fuel emissions were calculated through the emission factors published by Ispra in the "National Standards Table" (data updated to 2018).

GRI 305-2: Indirect Greenhouse Gas Emissions (Scope 2) ^(****)						
Performance Indicators	MU	Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Indirect Greenhouse Gas Emissions (Scope 2)	tCO ₂	11,991	491	12,482	12,846	12,081

GRI 306-1: Total discharge of water divided by quality and destination						
Performance Indicators	UdM	Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Total discharge of water	m³	5,424,842	24	5,424,866	31,136,128	51,992,429
River	m ³	5,385,824	24	5,385,848	5,887,328	5,432,859
Sea	m ³	19,018	-	19,018	25,228,800	46,539,600
Public Sewer Discharges	m ³	20,000	-	20,000	20,000	-

GRI 306-2: Total weight of waste, by type and method of disposal						
Performance Indicators	MU	Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Total produced waste	ton	14,819	7,080	21,899	18,711	19,088
Company	ton	2,123	7,080	9,203	7,226	4,900
Suppliers	ton	12,697	-	12,697	11,485	14,188
Total produced waste: hazardous	ton	60	6,942	7,002	9,785	5,989
Company	ton	23	6,942	6,965	4,891	3,007
Suppliers	ton	37	-	37	4,894	2,982
Total produced waste: non-hazardous	ton	14,760	138	14,898	8,926	13,099
Company	ton	2,100	138	2,238	2,335	1,893
Suppliers	ton	12,660	-	12,660	6,591	11,206
Total amount of waste disposed of	ton	2,968	6,946	9,914	12,760	6,501
Total amount of hazardous waste disposed of	ton	20	6,942	6,962	9,722	-
Company	ton	9	6,942	6,951	4,842	-
Suppliers	ton	11	-	11	4,879	-
Total amount of non-hazardous waste disposed of	ton	2,949	4	2,952	3,039	-
Company	ton	1,005	4	1,009	797	-
Suppliers	ton	1,944	-	1,944	2,242	-
Total amount of recovered waste	ton	12,509	134	12,643	5,225	12,584
Total amount of recovered hazardous waste	ton	44	0	44	58	-
Company	ton	14	0	14	49	-
Suppliers	ton	31	-	31	9	-
Total amount of recovered non-hazardous waste	ton	12,464	134	12,598	5,208	-
Company	ton	1,287	134	1,421	1,279	-
Suppliers	ton	11,177	-	11,177	3,929	-
Stocks in temp. storage facilities	ton	19	-	19	676	-
Stocks in temp. storage facilities: hazardous waste	ton	2	-	2	6	-
Company	ton	2	-	2	1	-
Suppliers	ton	-	-	-	5	-
Stocks in temp. storage facilities: non-hazardous waste	ton	16	-	16	670	-
Company	ton	16	-	16	209	-
Suppliers	ton	-	-	-	461	-
Other destination	ton	-	-	-	-	-

(****) The electricity consumptions were calculated through the emission factor provided by Terna (data available upon publication of this report updated at 2015).

HUMAN RESOURCES

GRI 102:8 - Staff information as of 31 December, divided by gender, professional category, contract type and place of work

Workforce by gender

		Sogin 2018			Nucleco 2018			Group 2018			Group 2017	Group 2016
		T.E.	T.M.	Total	T.E.	T.M.	Total	T.E.	T.M.	Total	Total	Total
Women	No.	250	3	253	33	-	33	283	3	286	289	296
Men	No.	646	5	651	176	4	180	822	9	831	840	875
Total	No.	896	8	904	209	4	213	1,105	12	1,117	1,129	1,171
<i>of which:</i>												
Full Time	No.	876	8	884	209	4	213	1,085	12	1,097	1,111	1,152
Part Time	No.	20	-	20	-	-	-	20	-	20	18	19

Workforce by place of work

		Sogin 2018			Nucleco 2018			Group 2018			Group 2017	Group 2016
		T.E.	T.M.	Total	T.E.	T.M.	Total	T.E.	T.M.	Total	Total	Total
Caorso	n.	106	3	109	3	1	4	109	4	113	114	123
Garigliano	n.	61	-	61	21	-	21	82	-	82	86	91
Latina	n.	86	2	88	6	-	6	92	2	94	91	106
Trino	n.	73	-	73	5	-	5	78	-	78	79	86
Bosco Marengo	n.	37	-	37	4	-	4	41	-	41	42	48
Casaccia	n.	61	-	61	2	-	2	63	-	63	67	213
Saluggia	n.	56	-	56	4	-	4	60	-	60	60	61
Rotondella	n.	58	2	60	19	-	19	77	2	79	77	78
Ispra	n.	0	-	-	8	-	8	8	-	8	9	10
Rome Headquarters	n.	353	1	354	135	2	137	488	3	491	494	344
Foreign Offices	n.	5	-	5	2	1	3	7	1	8	10	11
Total	n.	896	8	904	209	4	213	1,105	12	1,117	1,129	1,171

Self-employed workers, or non-employed by the Organisation, working under the Group supervision

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Trainees	n.	41	15	56	81	97

Workforce by gender

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Men	%	72.01%	84.51%	74.40%	74.40%	74.72%
Women	%	27.99%	15.49%	25.60%	25.60%	25.28%

GRI 401-1: Number and rate of people hired over the year, by age, gender and geographical area

Hirings

Hired staff by gender

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Men	n.	4	1	5	5	16
Women	n.	2	-	2	-	4
Total	n.	6	1	7	5	20

Hired staff by age

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Under 30	n.	-	-	-	1	7
30-40	n.	5	-	5	2	10
41-50	n.	1	-	1	-	1
Over 50	n.	-	1	1	2	2
Total	n.	6	1	7	5	20

Hired staff by place of work

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Caorso	n.	-	-	-	2	2
Garigliano	n.	-	-	-	-	-
Latina	n.	2	-	2	1	3
Trino	n.	-	-	-	-	-
Bosco Marengo	n.	-	-	-	-	-
Casaccia	n.	-	-	-	-	10
Saluggia	n.	-	-	-	-	-
Ispra	n.	-	-	-	-	-
Rotondella	n.	-	-	-	1	2
Rome Headquarters	n.	4	1	5	1	3
Foreign Offices	n.	-	-	-	-	-
Total	n.	6	1	7	5	20

Hiring rate by gender

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Men	%	0.44%	0.47%	0.45%	0.44%	1.37%
Women	%	0.22%	0.00%	0.18%	0.00%	0.34%
Total	%	0.66%	0.47%	0.63%	0.44%	1.71%

Hiring rate by age

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Under 30	%	0.00%	0.00%	0.00%	0.09%	0.60%
30-40	%	0.55%	0.00%	0.45%	0.18%	0.85%
41-50	%	0.11%	0.00%	0.09%	0.00%	0.09%
Over 50	%	0.00%	0.47%	0.09%	0.18%	0.17%
Total	%	0.66%	0.47%	0.63%	0.44%	1.71%

Hiring rate by place of work

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Caorso	%	0.00%	0.00%	0.00%	0.18%	0.17%
Garigliano	%	0.00%	0.00%	0.00%	0.00%	0.00%
Latina	%	0.22%	0.00%	0.18%	0.09%	0.26%
Trino	%	0.00%	0.00%	0.00%	0.00%	0.00%
Bosco Marengo	%	0.00%	0.00%	0.00%	0.00%	0.00%
Casaccia	%	0.00%	0.00%	0.00%	0.00%	0.85%
Saluggia	%	0.00%	0.00%	0.00%	0.00%	0.00%
Ispra	%	0.00%	0.00%	0.00%	0.00%	0.00%
Rotondella	%	0.00%	0.00%	0.00%	0.09%	0.17%
Rome Headquarters	%	0.44%	0.47%	0.45%	0.09%	0.26%
Foreign Offices	%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	%	0.66%	0.47%	0.63%	0.44%	1.71%

Employment terminations

Employment terminations by gender

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Men	n.	10	4	14	7	39
Women	n.	5	-	5	40	5
Total	n.	15	4	19	47	44

Employment terminations by age

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Under 30	n.	-	1	1	2	4
30-40	n.	2	1	3	8	4
41-50	n.	2	2	4	4	3
Over 50	n.	11	-	11	33	33
Total	n.	15	4	19	47	44

Employment terminations by place of work

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Caorso	n.	1	-	1	6	11
Garigliano	n.	1	-	1	5	2
Latina	n.	1	-	1	5	10
Trino	n.	-	1	1	6	1
Bosco Marengo	n.	-	-	-	7	1
Casaccia	n.	-	-	-	-	8
Saluggia	n.	-	-	-	2	2
Ispra (added)	n.	-	1	1	2	-
Rotondella	n.	-	-	-	1	-
Rome Headquarters	n.	12	2	14	13	8
Foreign Offices	n.	-	-	-	-	1
Total	n.	15	4	19	47	44

Employment termination rate by gender

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Men	%	1.11%	1.88%	1.25%	0.62%	3.33%
Women	%	0.55%	0.00%	0.45%	3.54%	0.43%
Total	%	1.66%	1.88%	1.70%	4.16%	3.76%

Employment termination rate by age

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Under 30	%	0.00%	0.47%	0.09%	0.18%	0.34%
30-40	%	0.22%	0.47%	0.27%	0.71%	0.34%
41-50	%	0.22%	0.94%	0.36%	0.35%	0.26%
Over 50	%	1.22%	0.00%	0.98%	2.92%	2.82%
Total	%	1.66%	1.88%	1.70%	4.16%	3.76%

Employment termination rate by place of work

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Caorso	%	0.11%	0.00%	0.09%	0.53%	0.94%
Garigliano	%	0.11%	0.00%	0.09%	0.44%	0.17%
Latina	%	0.11%	0.00%	0.09%	0.44%	0.85%
Trino	%	0.00%	0.47%	0.09%	0.53%	0.09%
Bosco Marengo	%	0.00%	0.00%	0.00%	0.62%	0.09%
Casaccia	%	0.00%	0.00%	0.00%	0.00%	0.68%
Saluggia	%	0.00%	0.00%	0.00%	0.18%	0.17%
Ispra (added)	%	0.00%	0.47%	0.09%	0.18%	0.00%
Rotondella	%	0.00%	0.00%	0.00%	0.09%	0.00%
Rome Headquarters	%	1.33%	0.94%	1.25%	1.15%	0.68%
Foreign Offices	%	0.00%	0.00%	0.00%	0.00%	0.09%
Total	%	1.66%	1.88%	1.70%	4.16%	3.76%

GRI 401-3: Employees who have taken parental leave**Number of employees who have taken parental leave**

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Men	n.	21	3	24	29	10
Women	n.	35	1	36	43	36
Total	n.	56	4	60	72	46

Number of employees who were entitled to parental leave

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Men	n.	21	3	24	27	9
Women	n.	34	1	35	43	34
Total	n.	55	4	59	70	43

GRI 404-1: average number of training hours per employee**Total number of training hours provided**

		Group 2018	Group 2017
To the Company staff	hours	28,708	38,014
<i>Sogin</i>	<i>hours</i>	<i>24,880</i>	<i>30,109</i>
<i>Nucleco</i>	<i>hours</i>	<i>3,828</i>	<i>7,906</i>
Other Staff	hours	2,136	3,414
<i>Trainees</i>	<i>hours</i>	<i>1,793</i>	<i>2,906</i>
<i>External Collaborators</i>	<i>hours</i>	<i>-</i>	<i>508</i>
Total	hours	30,843	41,428

Total number of annual training hours by type

		Group 2018	Group 2017	Group 2016
Upon entrance	hours	208	412	1,240
Managers	hours	1,180	1,862	490
Technical Specialists	hours	9,079	17,989	17,555
Nuclear and conventional safety	hours	20,136	20,821	34,926
Training on the job	hours	240	344	1,610
Total	hours	30,843	41,428	55,821

Average annual training hours by gender (per capita)

		Group 2018	Group 2017	Group 2016
Men	hours	25	33	45
Women	hours	28	35	53
Total	hours	26	34	47

Average annual training hours by professional category (per capita)

		Group 2018	Group 2017	Group 2016
Managers	hours	14	28	31
Executives	hours	24	34	43
White collars	hours	28	34	52
Blue collars	hours	22	33	39
Total	hours	26	34	47

GRI 405-1: Staff divided by professional category, gender and age updated to 31 December*

Total Workforce by professional category

		Sogin 2018			Nucleco 2018			Group 2018			Group 2017
		Women	Men	Total	Women	Men	Total	Women	Men	Total	Total
Managers	no.	1	27	28	-	-	-	1	27	28	31
Executives	no.	62	159	221	3	16	19	65	175	240	243
White collars	no.	183	319	502	28	86	114	211	405	616	620
Blue Collars	no.	7	146	153	2	78	80	9	224	233	235
Total	n.	253	651	904	33	180	213	286	831	1,117	1,129
Managers	%	0.11%	2.99%	3.10%	0.00%	0.00%	0.00%	0.09%	2.42%	2.51%	2.75%
Executives	%	6.86%	17.59%	24.45%	1.41%	7.51%	8.92%	5.82%	15.67%	21.49%	21.52%
White collars	%	20.24%	35.29%	55.53%	13.15%	40.38%	53.52%	18.89%	36.26%	55.15%	54.92%
Blue collars	%	0.77%	16.15%	16.92%	0.94%	36.62%	37.56%	0.81%	20.05%	20.86%	20.81%
Total	%	28%	72%	100%	15%	85%	100%	26%	74%	100%	100%

GRI 405-1: Staff divided by professional category, gender and age updated to 31 December*

Workforce by age

		Sogin 2018					Nucleco 2018					Group 2018					Group 2017				
		<30 years	30-40 years	41-50 years	>50 years	Total	<30 years	30-40 years	41-50 years	>50 years	Total	<30 years	30-40 years	41-50 years	>50 years	Total	<30 years	30-40 years	41-50 years	>50 years	Total
Managers	n.	-	-	4	24	28	-	-	-	-	-	-	-	4	24	28	-	-	7	24	31
Executives	n.	-	9	84	128	221	-	6	5	8	19	-	15	89	136	240	-	17	95	131	243
White Collars	n.	14	241	126	121	502	9	71	12	22	114	23	312	138	143	616	54	298	133	135	620
Blue Collars	n.	30	70	34	19	153	16	34	15	15	80	46	104	49	34	233	55	104	45	31	235
Total	n.	44	320	248	292	904	25	111	32	45	213	69	431	280	337	1,117	109	419	280	321	1,129
Managers	%	0.00%	0.00%	0.44%	2.65%	3.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.36%	2.15%	2.51%	0.00%	0.00%	0.62%	2.13%	2.75%
Executives	%	0.00%	1.00%	9.29%	14.16%	24.45%	0.00%	2.82%	2.35%	3.76%	8.92%	0.00%	1.34%	7.97%	12.18%	21.49%	0.00%	1.51%	8.41%	11.60%	21.52%
White Collars	%	1.55%	26.66%	13.94%	13.38%	55.53%	4.23%	33.33%	5.63%	10.33%	53.52%	2.06%	27.93%	12.35%	12.80%	55.15%	4.78%	26.40%	11.78%	11.96%	54.92%
Blue Collars	%	3.32%	7.74%	3.76%	2.10%	16.92%	7.51%	15.96%	7.04%	7.04%	37.56%	4.12%	9.31%	4.39%	3.04%	20.86%	4.87%	9.21%	3.99%	2.75%	20.81%
Total	%	5%	35%	27%	32%	100%	12%	52%	15%	21%	100%	6%	39%	25%	30%	100%	10%	37%	25%	28%	100%

* The staff was divided by category and age starting from 2017, thus, a detailed comparison cannot be made with year 2016.

GRI 405-1: Board of Directors members divided by gender and age**Sogin BoD divided by gender**

		2018	2017	2016
Men	no.	3	3	4
Women	no.	2	2	1
Total	no.	5	5	5

Sogin BoD by age

		2018	2017	2016
Under 30	no.	0	0	0
30-40	no.	1	2	0
41-50	no.	1	0	1
Over 50	no.	3	3	4
Total	no.	5	5	5

GRI 405-2: Salary Ratio between men and women divided by professional category**Salary ratio between men and women by category**

		Sogin 2018	Nucleco 2018	Group 2018	Group 2017	Group 2016
Managers	%	69.78	0	69.78	70.98	70.00
Executives	%	93.3	108.51	94.8	93.72	93.60
White Collars	%	95.81	102.59	98	97.24	96.03
Blue Collars	%	99.52	97.7	102.16	101.09	98.50

GRI TABLE

Topics	Standard Reference GRI	Reporting Scope	
		Internal	External
Accountability and collaboration with national Institutions and Associations	GRI 201: ECONOMIC PERFORMANCE	X	
	GRI 415: PUBLIC POLICY	X	
	GRI 419: SOCIOECONOMIC COMPLIANCE	X	
	GRI 413: LOCAL COMMUNITIES	X	
Engagement and dialogue with local stakeholders	GRI 413: LOCAL COMMUNITIES	X	
Decommissioning progress - physical	GRI 302: ENERGY	X	
	GRI 303: WATER	X	
	GRI 305: EMISSIONS	X	
Legal compliance	GRI 419: SOCIOECONOMIC COMPLIANCE	X	
	GRI 307: ENVIRONMENTAL COMPLIANCE	X	
Fight against Corruption	GRI 205: ANTI- CORRUPTION	X	
Circular Economy	GRI 301: MATERIALS	X	
	GRI 306: EFFLUENTS AND WASTE	X	
Radioactive Waste Management	GRI 306: EFFLUENTS AND WASTE	X	
Siting of the National Repository and Tech. Park	GRI 413: LOCAL COMMUNITIES	X	
	GRI 203: INDIRECT ECONOMIC IMPACTS	X	
Radiological Safety	GRI 403: OCCUPATIONAL HEALTH AND SAFETY	X	
Safety in the workplace	GRI 403: OCCUPATIONAL HEALTH AND SAFETY	X	
Supply chain	GRI 204: PROCUREMENT PRACTICES	X	
	GRI 308: SUPPLIER ENVIRONMENTAL ASSESSMENT	X	
	GRI 414: SUPPLIER SOCIAL ASSESSMENT	X	
HR Development, Talent Management and Equal Opportunity	GRI 401: EMPLOYMENT	X	
	GRI 402: LABOR/MANAGEMENT RELATIONS	X	
	GRI 404: TRAINING AND EDUCATION	X	
	GRI 405: DIVERSITY AND EQUAL OPPORTUNITY	X	
Corporate Welfare, Workers' Health and Wellbeing	GRI 401: EMPLOYMENT	X	
Decommissioning Progress - costs	N/A	X	
Sharing of Scientific know-how	N/A	X	
Technological Innovation and Research	N/A	X	

GRI CONTENT INDEX

General Disclosures				
GRI Standard	Disclosure	Section	Page Number or link	Omissions or limitations
	102-1 Name of the organization	About Us	14	
	102-2 Activities, brands, products, and services	About Us Market Operations in Italy Foreign Market Operations	14 76 78	
	102-3 Location of headquarters	Via Marsala no. 51 C, 00185 - Rome	-	
	102-4 Location of operations	About Us Market Operations in Italy Foreign Market Operations	14 76 78	
	102-5 Ownership and legal form	Governance	16	
	102-6 Market served	About Us Market Operations in Italy Foreign Market Operations	14 76 78	
	102-7 Scale of the organization	About Us Economic Outcomes Human Resources Indicators	14 28 132	
	102-8 Information on employees and other workers	Attention to Human Resources Human Resources Indicators	98 132	
	102-9 Supply chain	Suppliers	105	
	102-10 Significant changes to the organization and its supply chain	Methodological Note	10	
	102-11 Precautionary Principle or approach	Integrated Management System for quality, environment and safety The Group adopts a risk-based thinking approach when managing its activities and operations; this approach aims at identifying, qualifying and managing risks.	25	
GRI 102: General Disclosure	102-12 External initiatives	Relations with institutions	88	
	102-13 Membership of associations	National Network Development International Network Development	90 91	
	102-14 Statement from senior decision-maker	Letter to stakeholders	8	
	102-16 Values, principles, standards, and norms of behavior	About Us	15	
	102-18 Governance structure	Governance	16	
	102-40 List of stakeholder groups	Stakeholders' Map	86	
	102-41 Collective bargaining agreements	Attention to Human Resources	98	
	102-42 Identifying and selecting stakeholders	Stakeholders' engagement	84	
	102-43 Approach to stakeholder engagement	Stakeholders' engagement	84	
	102-44 Key topics and concerns raised	Stakeholders' engagement	84	
	102-45 Entities included in the consolidated financial statements	Methodological Note	10	
	102-46 Defining report content and topic boundaries	Methodological Note Stakeholders' engagement	10 84	
	102-47 List of material topics	Methodological Note Stakeholders' engagement	10 84	
102-48 Restatements of information	Methodological Note	10		

GRI Standard	Disclosure	Section	Page Number or link	Omissions or limitations
	102-49 Changes in reporting	Methodological Note	10	
	102-50 Reporting period	Methodological Note	10	
	102-51 Date of most recent report	Methodological Note	10	
	102-52 Reporting cycle	Methodological Note	10	
	102-53 Contact point for questions regarding the report	Methodological Note	10	
	102-54 Claims of reporting in accordance with the GRI Standards	Methodological Note	10	
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	102-56 External assurance	Governance	18	

Material Topics

Economic Performance (Accountability and collaboration with national Institutions and Associations)

GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Economic Outcomes Stakeholders' engagement	28 84	
	103-3 Evaluation of the management approach	Economic Outcomes	28	
GRI 201: Economic Performance	201-1 Direct economic value generated and distributed	Economic Outcomes	28	
	201-4 Financial assistance received from government	Governance Economic Outcomes	16 28	

Indirect Economic Impacts (NRTP Siting)

GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	National Repository and Technological Park Stakeholders' engagement	64 84	
	103-3 Evaluation of the management approach	National Repository and Technological Park	64	
GRI 203: Indirect Economic Impacts	203-1 Infrastructure investments and services supported	National Repository and Technological Park	64	
	203-2 Significant indirect economic impacts	National Repository and Technological Park	64	

Procurement Practices (Supply chain)

GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Stakeholders' engagement Suppliers	84 105	
	103-3 Evaluation of the management approach	Suppliers	105	
GRI 204: Procurement Practices	204-1 Proportion of spending on local suppliers	Suppliers	105	

Anti-corruption (Fight against corruption)

GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Governance Stakeholders' engagement	16 84	
	103-3 Evaluation of the management approach	Governance	16	
			18	
			19	
GRI 205: ANTI-CORRUPTION	205-3 Confirmed incidents of corruption and actions taken	Governance		https://www.sogin.it/it/grupposogin/governanceetrasparenza/societatrasparente/Pagine/default.aspx

GRI Standard	Disclosure	Section	Page Number or link	Omissions or limitations
Materials (Circular Economy)				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Integrated Management System for quality, environment and safety Stakeholders' engagement Circular Economy Strategy Promotion of good environmental practices	25 84 112 127	
	103-3 Evaluation of the management approach	Integrated Management System for Quality, Environment and Safety Circular Economy Strategy Promotion of good environmental practices	25 112 127	
GRI 301: Materials	301-1 Material used by weight or volume	Integrated Management System for quality, environment and safety Circular Economy Strategy Environmental Indicators	25 112 130	
Energy (Decommissioning operations - physical)				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Integrated Management System for Quality, Environment and Safety Stakeholders' engagement Promotion of Good Environmental Practices	25 84 127	
	103-3 Evaluation of the management approach	Integrated Management System for Quality, Environment and Safety Promotion of Good Environmental Practices	25 127	
GRI 302: Energy	302-1 Energy consumption within the organization	Integrated Management System for quality, environment and safety, Environmental Indicators	25 130	
Water (Decommissioning operations - physical)				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Integrated Management System for quality, environment and safety Stakeholders' engagement	25 84	
	103-3 Evaluation of the management approach	Integrated Management System for quality, environment and safety	25	
GRI 303: Water	303-1 Water withdrawal by source	Integrated Management System for quality, environment and safety Environmental Indicators	25 130	
Emissions (Decommissioning operations - physical)				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Integrated Management System for quality, environment and safety Stakeholders' engagement Promotion of Good Environmental Practices	25 84 127	

GRI Standard	Disclosure	Section	Page Number or link	Omissions or limitations
	103-3 Evaluation of the management approach	Integrated Management System for quality, environment and safety Promotion of Environmental Good Practices	25 127	
GRI 305: Emissions	305-1 Direct (Scope 1) GHG emissions	Integrated Management System for quality, environment and safety	25	
	305-2 Energy indirect (Scope 2) GHG emissions	Environmental indicators	130	
Effluents and Waste (Circular Economy; Radioactive Waste Management)				
	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
GRI 103: Management approach	103-2 The management approach and its components	Integrated Management System for quality, environment and safety Stakeholders' engagement Circular Economy Strategies Promotion of Environmental Good Practices	25 84 112 127	
	103-3 Evaluation of the management approach	Integrated Management System for quality, environment and safety Circular Economy Strategies Promotion of Environmental Good Practices	25 112 127	
GRI 306: Effluents and waste	306-1 Water discharge by quality and destination	Integrated Management System for quality, environment and safety Inventory of radioactive waste	25 62	
	306-2 Waste by type and disposal method	Circular Economy Strategies Environmental indicators	112 130	
Environmental Compliance (Legal Compliance)				
	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
GRI 103: Management approach	103-2 The management approach and its components	Integrated Management System for quality, environment and safety Stakeholders' Engagement	25 84	
	103-3 Evaluation of the management approach	Governance Integrated Management System for quality, environment and safety	16 25	
GRI 307: Environmental Compliance	307-1 Non-compliance with environmental laws and regulations	Governance Integrated Management System for quality, environment and safety Environmental indicators	19 25 130	
Supplier Environmental Assessment (Supply chain)				
	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
GRI 103: Management approach	103-2 The management approach and its components	Stakeholders' engagement Suppliers	84 105	
	103-3 Evaluation of the management approach	Suppliers	105	
GRI 308: Supplier Environmental Assessment	308-1 New suppliers that were screened using environmental criteria	Suppliers	105	
Employment (HR development, Talent management and Equal Opportunity; Corporate Welfare, workers' health and wellbeing)				
	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
GRI 103: Management approach	103-2 The management approach and its components	Stakeholders' engagement Attention to Human Resources	84 98	
	103-3 Evaluation of the management approach	Attention to Human Resources	98	

GRI Standard	Disclosure	Section	Page Number or link	Omissions or limitations
GRI 401: Employment	401-1 New employees hires and employee turnover	Attention to Human Resources	98	
	401-3 Parental leave	Human Resources Indicators	132	
	Labor/Management Relations (HR development, Talent management and Equal Opportunity)			
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Stakeholders' engagement Attention to Human Resources	84 98	
	103-3 Evaluation of the management approach	Attention to Human Resources	98	
GRI 402: Labor/Management Relations	402-1 Minimum notice periods regarding operational changes	Attention to Human Resources Human Resources Indicators	98 132	
Occupational Health & Safety (Radiological Safety; Safety in the workplace)				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Stakeholders' engagement Workers safety Radiological Safety	84 100 103	
	103-3 Evaluation of the management approach	Workers safety Radiological Safety	100 103	
GRI 403: Occupational Health & Safety	403-2 Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	Workers safety Radiological Safety	100 103	
	403-3 Workers with high incidence or high risk of diseases related to their occupation	Human Resources Indicators	132	
Training and education (HR development, Talent management and Equal Opportunity)				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Stakeholders' engagement Know-how Development	84 94	
	103-3 Evaluation of the management approach	Know-how Development	94	
GRI 404: Training and education	404-1 Average hours of training per year per employee	Know-how Development Human Resources Indicators	94 132	
Diversity and Equal Opportunity (HR development, Talent management and Equal Opportunity)				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Stakeholders' engagement Attention to Human Resources	84 98	
	103-3 Evaluation of the management approach	Attention to Human Resources	98	
GRI 405: Diversity and Equal Opportunity	405-1 Diversity of governance bodies and employees	Attention to Human Resources	98	
	405-2 Ratio of basic salary and remuneration of women to men	Human Resources Indicators	132	
Local Communities (Accountability and collaboration with national Institutions and Associations; local communities Engagement; NRTP siting)				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	National Repository and Technological Park Stakeholders' engagement	64 84	
	103-3 Evaluation of the management approach	National Repository and Technological Park	64	
GRI 413: Local Communities	413-1 Operations with local community engagement, impact assessments, and development programs	National Repository and Technological Park	64 84	
	413-2 Operations with significant actual and potential negative impacts on local communities	Stakeholders' engagement	84	

GRI Standard	Disclosure	Section	Page Number or link	Omissions or limitations
Supplier Social Assessment (Supply chain)				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Stakeholders' engagement Suppliers	84 105	
	103-3 Evaluation of the management approach	Suppliers	105	
GRI 414: Supplier Social Assessment	414-1 New suppliers that were screened using social criteria	Suppliers	106	
Public Policy (Accountability and collaboration with national Institutions and Associations)				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Stakeholders' engagement Relations with institutions	84 88	
	103-3 Evaluation of the management approach	Relations with institutions	88	
GRI 415: Public Policy	415-1 Political contributions	Relations with institutions		<i>The Group does not pay contributions to political parties, committees, organisations and Trade Unions. When a contribution is deemed appropriate for the public interest, Sogin decides whether it is admissible or not in compliance with applicable laws. All contributions shall be paid and accurately recorded in compliance with applicable laws. The recipients of this Code are required to acknowledge that any form of engagement in political activities takes place on a personal basis, as stated under applicable relevant laws.</i>
Socio Economic Compliance (Accountability and collaboration with national Institutions and Associations; Legal Compliance)				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	84 138	
	103-2 The management approach and its components	Governance Stakeholders' engagement	16 84	
	103-3 Evaluation of the management approach	Governance	16	
GRI 419: Socio Economic Compliance	419-1 Non-compliance with laws and regulation in the social and economic area	Governance	16	
Decommissioning progress - Costs				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table		<i>No disclosure of the GRI can be directly applied. The document presents a description of the management approach and information of qualitative and quantitative nature concerning the material topic.</i>
	103-2 The management approach and its components	Stakeholders' engagement National Repository and Technological Park		
	103-3 Evaluation of the management approach	National Repository and Technological Park		
Sharing of scientific know-how				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table		<i>No disclosure of the GRI can be directly applied. The document presents a description of the management approach and information of qualitative and quantitative nature concerning the material topic.</i>
	103-2 The management approach and its components	Stakeholders' engagement Know-how Development		
	103-3 Evaluation of the management approach	Know-how Development		

GRI Standard	Disclosure	Section	Page Number or link	Omissions or limitations
Technological Innovation and Research				
GRI 103: Management approach	103-1 Explanation of the material topic and its Boundary	Stakeholders' engagement GRI Table	<i>No disclosure of the GRI can be directly applied. The document presents a description of the management approach and information of qualitative and quantitative nature concerning the material topic.</i>	
	103-2 The management approach and its components	Stakeholders' engagement Decommissioning sites Know-how Development Project Management		
	103-3 Evaluation of the management approach	Decommissioning sites Know-how Development Project Management		



**INDEPENDENT REPORT ON THE LIMITED ASSURANCE
ENGAGEMENT OF THE SUSTAINABILITY REPORT 2018**

SO.G.I.N. SPA



Independent report on the limited assurance engagement of the Sustainability Report 2018

To the Board of Directors of
SO.G.I.N. SpA

We have carried out a limited assurance engagement on the Sustainability Report (hereinafter the “Report”) of SO.G.I.N. SpA and its subsidiaries (hereinafter “SO.G.I.N. Group”) for the year ended 31 December 2018.

Responsibility of the Directors for the Sustainability Report

The Directors are responsible for preparing the Report in compliance with the Sustainability Reporting Standards issued in 2016 by the *GRI* - Global Reporting Initiative (hereinafter “GRI Standards”), and in compliance with the principle of Inclusivity, Materiality, Responsiveness and Impact set out in the AA1000 AccountAbility Principles Standard (2018), published by AccountAbility (Institute of Social and Ethical Accountability), as indicated in paragraph “Methodological note” of the Report, and for that part of internal control that they consider necessary to prepare a sustainability report that is free from material misstatement, whether due to fraud or error. The Directors are also responsible for defining the sustainability performance targets of the Group, for reporting the sustainability results, as well as for identifying its stakeholders and material topics to be reported on.

Auditor’s Independence and Quality Control

We are independent in compliance with the principles of ethics and independence with regard to the Code of Ethics for Professional Accountants published by the International Ethics Standard Board for Accountants, based upon fundamental principles of integrity, objectiveness, expertise and professional diligence, confidentiality and professional behavior, on which we confirmed the compliance in accordance with the dell’AA1000 AccountAbility Assurance Standard (2008), not having conducted activities or services for the SO.G.I.N. Group that could have generated a conflict with our independence profile. Our firm applies International Standard on Quality Control 1 (ISQC (Italy) 1) and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with the ethical requirements, professional standards and applicable legal and regulatory requirements.

PricewaterhouseCoopers SpA

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Auditor's Responsibilities

We are responsible for the preparation of this report based on the work performed. We conducted our engagement in accordance with International Standard on Assurance Engagements 3000 (Revised) – Assurance Engagements other than Audits or Reviews of Historical Financial Information (ISAE 3000), issued by the IAASB (International Auditing and Assurance Standards Board) for limited assurance engagements. The standard requires that we comply with applicable ethical requirements, including professional independence, and that we plan and perform procedures to obtain limited assurance about whether the Sustainability Report is free from material misstatement.

The procedures consisted in interviews, primarily of company personnel responsible for the preparation of the information presented in the Report, inspection of documents, recalculations and other verification procedures designed to obtain evidence considered useful.

The procedures we performed consisted in verifying compliance of the Report with the principles for defining the content and the quality of a sustainability report set out in the GRI Standards and in the AA1000 AccountAbility Principles Standard (2018), and are summarised as follows:

- comparing the financial information reported in the Report with the information included in the “Economic Outcome” paragraph of the SO.G.I.N. Group consolidated financial statements as of 31 December 2018 on which we issued our audit opinion in accordance with article 14 of Legislative Decree No. 39 of 27 January 2010 on 7 June 2019;
- analysing, through inquiries, the governance system and the process for managing the sustainability issues relating to the SO.G.I.N. Group’s strategy and operations;
- analysing the process aimed at defining the significant reporting areas to be disclosed in the Report, with regard to the methods for their identification, in terms of priority for the various stakeholders, as well as the internal validation of the process findings;
- analysing the functioning of the processes underlying the generation, recording and management of quantitative data included in the Report. In detail, we carried out:
 - meetings and interviews with management personnel of SO.G.I.N. SpA to gather information about the IT, accounting and reporting systems in use to prepare the Report, as well as processes and procedures supporting the collection, aggregation, processing and submission of the information to the function responsible for the Report preparation;
 - a sample-based analysis of the documents supporting the preparation of the Report, in order to obtain evidence of the processes in place, the process adequacy in respect of the treatment of the information and data relating to the objectives disclosed in the Report;
- analysing the stakeholder engagement process with reference to the methods used, through the analysis of the minutes of meetings or any other existing documentation on the main aspects emerged from the dialogue with them;
- analysing the internal consistency of the qualitative information described in the Report and its compliance with the guidelines identified in the preceding paragraph “Responsibility of the Directors for the Sustainability Report”;
- obtaining a representation letter, signed by the legal representative of SO.G.I.N. SpA, on the compliance of the Report with the guidelines identified in the paragraph “Responsibility of the Directors for the Sustainability Report”, as well as the reliability and completeness of the disclosed information.



Our limited assurance work was less in scope than a reasonable assurance engagement performed in accordance with ISAE 3000 (reasonable assurance engagement) and, consequently, it does not provide us with a sufficient level of assurance necessary to become aware of all significant facts and circumstances that might be identified in a reasonable assurance engagement.

Conclusion

Based on the work performed, nothing has come to our attention that causes us to believe that the Sustainability Report of the SO.G.I.N. Group for the year ended 31 December 2018 is not prepared, in all material respects, in accordance with the Sustainability Reporting Standards defined in 2016 by the GRI - Global Reporting Initiative and the AA1000 AccountAbility Principles Standard (2018), as illustrated in the “Methodological note” section of the Sustainability Report.

Rome, 9 July 2019

PricewaterhouseCoopers SpA

Signed by

Pierpaolo Mosca
(Partner)

This report has been translated from the Italian original solely for the convenience of international readers. We have not performed any controls on the Sustainability Report 2018 translation.



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