



NUCLÉARELECTRICA

## Development Strategy (2015 ÷ 2025)



December 2014

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## 1. INTRODUCTION

The purpose of this document is to provide an overview and an initial assessment of the long term development strategy of S.N. Nuclearelectrica S.A. („SNN”).

According to the World Nuclear Association (“WNA”), the nuclear energy provides about 11,5% of the world’s electricity and approximately 27% in the European Union (“EU”)<sup>1</sup>. Moreover, the EU Energy Roadmap for 2050 states that nuclear energy is a decarbonisation option providing today most of the low-carbon electricity consumed in the EU, while also making a major contribution in reducing dependence on the imported natural gas.

In Romania, nuclear power is a sustainable alternative for the development of a balanced portfolio of energy sources. The importance of nuclear energy is also stated in the Romanian Energy Strategy 2007-2020, taking into account the limited natural gas and coal resources and also the need to obtain competitive prices for electricity produced at lower CO2 emissions.

Considering the ongoing changes at world’s and European’s level, it becomes essential to up-date the National Energy Strategy in accordance with the objectives of the new EU policy for a competitive, sustainable and secure energy, articulating in a clear way both the main objectives and the priority actions, in the framework of a liberalised market. For that purpose, in December 2014, the Department for Energy prepared and submitted for public debate a draft „National Energy Strategy for the period 2015-2035 and Outlook to 2050”. The document considers achieving a diversified and balanced energy mix, efficiently using all the domestic primary energy resources, as well as the modern technologies that allow the long term use of fossil fuels with low greenhouse gas emissions, renewables and nuclear energy.

Alongside other major producers within the Romanian electricity market, SNN has the mission of meeting domestic demand in the context of assuring at the same time nuclear safety, environment protection, and the population and staff safety.

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<sup>1</sup> World Nuclear Association report - 2014

## 2. MAIN MILESTONES OF SNN's DEVELOPMENT STRATEGY

### 2.1. Nuclear energy in the framework of the future National Energy Strategy

The new energy strategy of Romania for the period 2015-2035, aims at the following objectives:

- Ensuring the energy security of supply and the economic and social development, in the context of a future increase of energy demand;
- Assuring economic competitiveness by maintaining an affordable price for the end consumers;
- Environment protection by limiting the climate change effects.

In order to address the three major challenges, Romania will consider achieving a diversified and balanced energy mix, efficiently using all the domestic primary energy resources, as well as the modern technologies that allow the long term use of fossil fuels with low greenhouse gas emissions, renewables and nuclear energy.

On the background of the financial crisis and contraction of the economy, the electricity consumption and, as a result, the electricity prices, have significantly dropped both in Romania as well as at regional and global level. Thus, the existing installed production capacities exceed the electricity needs. In Romania, the coal based electricity producers were significantly impacted, augmented both on the ground of producers' separation by source of generation (coal, gas, nuclear, hydro) and by the new renewable capacities which became operational.

The gradual recovery of the Romania's and the regional economies will lead to a slower catch up pace on the electricity consumption, considering the industrial consumers objective to remain competitive at regional and worldwide level.

The objective of Romania's energy sector to ensure the security of energy and heating supply for all consumers, at an appropriate quality level, has to be achieved with the lowest costs for consumers, observing the environmental requirements and in accordance with the objectives set out in the Policy framework for climate and energy in the period from 2020 to 2030 prepared by the European Commission and the European Energy Security Strategy, so that the security of supply, industry competitiveness and jobs' protection to be maintained.

To date, the operational nuclear power capacities in Romania, as well as the associated supply chain activities have proven the following advantages and oportunities:

#### Competitive advantages

- Complete nuclear fuel cycle;
- Low impact of the uranium price fluctuation, component of the nuclear fuel cost, as compared with other fossil fuels;
- Safe, internationally recognized technology;
- Low carbon emission technology;
- Sound regulation framework in the nuclear field;
- High operational and technical performance;
- Personnel training programs consistent with best practices and international standards;
- Maintaining a close cooperation with the nuclear technology provider;
- Solid experience in operation, well documented, accesible and preserved.

## Opportunities

- Significant contributor to the security of supply and carbon emission reduction;
- The possibility to identify alternative uranium supply sources from the international market, from geographical areas free of conflicts or political conditionalities;
- Technological capability of processing sterile;
- Production optimization through planning the maintenance outages in correlation with the demand curves;
- Development of research programs in the nuclear energy field.

Hence, the increase of the installed capacity of Cernavoda NPP with additional two units was identified as being the optimal solution to cover the capacity deficit after 2020, both from a technical economic and completion schedule standpoint as well as from the perspective of using internal resources and existing national infrastructure developed on CANDU technology.

Cernavoda NPP Project represents an investment in low carbon emission technology, indispensable for Romania, in the framework of the very ambitious decarbonisation targets set at EU level, i.e. to reduce by 40% the greenhouse gas emissions until 2030. At the same time, it is necessary to consider that such large projects require major capital injections during the construction phase, but provide stable and secure income during operation (the nuclear capacities are operated in base load, over a period of 50 years, thus significantly contributing to the security of the National Power System).

In the current economic and electricity market framework which does not provide sufficient conditions to complete investments in large energy infrastructure projects, needed for the energy sector, with a major impact on Romania's economic revival, corroborated with the specifics of the low carbon emission technologies, often capital intensive and requiring longer construction and completion periods, it is necessary to identify the support mechanisms to facilitate investments in large energy projects, based on liberalized energy market principles and observing the EU regulations regarding transparency, competition and State aid. The securisation could be achieved both through fiscal mechanisms and through commercial instruments adapted to the energy sector, allowing mainly the predictability of the return of investment for the investors in the low carbon technologies capacities.

## 2.2. Electricity market outlook

### *Waiver of price regulation*

- Full liberalization of the market starting 1 January 2018 will increase the average electricity price for the final consumer.
- Along with further liberalization, the switching rate of suppliers is expected to increase among captive consumers which will enhance competition on this market.

### *Drop in consumption*

- Marked by the severe impact of global financial crisis, consumption has declined in recent years and no significant growth is likely in the short and medium term.
- Supply of electricity is characterized, in the short and medium term by an excess of capacity. In 2014, significantly large exports partially mitigated overcapacity crisis.
- The integration of energy markets is an Europe-wide strategic objective assumed by all Member States of the European Union. Given the higher final prices in the region, electricity trading outside Romania will continue to be an opportunity for local players.

*Improving energy efficiency*

- EU energy strategy, focusing on climate change, therefore on decarbonisation, imposes various barriers on the use of coal in energy production by limiting CO2 emissions.
- Hence, in the long term the need to increase the share of nuclear and hydro with a limited CO2 footprint in production mix is emerging.

**2.3. Mission, vision and core values of SNN**

**Mission**

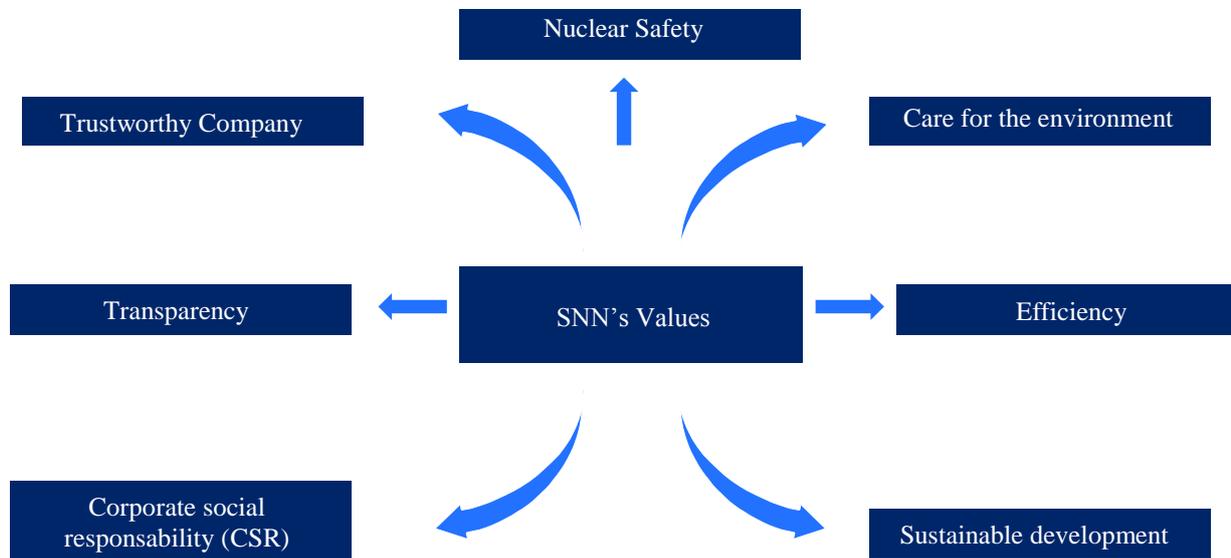
SNN’s mission is to generate electricity and thermal power using nuclear technology, to develop nuclear power and to manufacture nuclear fuel, ensuring high safety, economic efficiency and taking care of people and environment.

**Vision**

SNN is an important player on the Romanian energy market, ensuring approximately 20% of the country’s total electricity demand (17.9% in the first 9 months of 2014) through Units 1 and 2 located in Cernavoda. In addition, Cernavoda NPP annually supplies around 35,000 Gcal for heating the town of Cernavoda and the industrial consumers in the industrial area near the plant.

**Core values and objectives**

The core values of the Company are presented below:



## 2.4. SNN's strategic objectives

The Company has a coherent and strong conceptual core of its mission, goals and values. Goals are a comprehensive image of SNN's annual breakdown of objectives, which are on their turn sustained and fueled to completion by specific activities.

Alongside other major producers within the Romanian electricity market, Nuclearelectrica has the mission of meeting the internal demand in the context of assuring nuclear security, environment protection, and the population and staff safety.

Among the main characteristics of SNN, one can mention: a high availability factor of the installed capacity, no CO<sub>2</sub> emissions, low price elasticity to uranium fuel cost variation, stable and predictable generation costs and high technical expertise of specialized personnel.

The strategic objectives are developed on basis of the national and international context, such as: Romanian governmental support for nuclear energy, the pending necessity of refurbishing the aging Romanian electricity generation assets, an electricity demand synchronized with GDP's development, diversification tendency in relation to energy production facilities (support of renewable generation sources; impact of rising oil prices), development of major energy production companies with large capacities and active international activities.

### **The SNN's long term strategic objectives are the following:**

1. The operation of the nuclear facilities under nuclear safety and security conditions for the personnel, population, environment and production assets;
2. Maintaining the electric energy production capacity above the current average industry level;
3. The achievement of the major investment objectives;
4. The improvement of the Company's financial performance indicators;
5. Ensure the security of supply of raw materials;
6. Diversification of the portfolio of activities;
7. Use of the assets that currently do not generate income.

## 2.5. Measures aimed at achieving the strategic objectives

SNN shall focus mainly on playing an important role in producing the electricity on the Romanian market, by operating Units 1 and 2 in a safe and efficient manner.

The measures aimed at achieving the strategic objectives are presented below.

For the **operation of the nuclear facilities under nuclear safety and security conditions for the personnel, population, environment and production assets**, the following are considered:

- Maintaining a maximum degree of availability of the technological systems and with nuclear safety functions;
- Improving/maintaining a high level of professional training of the operation personnel of the two units;
- Maintaining the volume of radioactivity release into air and water below the regulated level;
- Ensure the continuity regarding the affiliation to the international organisations in the field of nuclear energy and, if applicable, affiliation to other organisations.

In terms of **maintaining the electric energy production capacity above the current average industry level:**

- Carry out the maintenance and repairs plans in order to increase the equipments and systems reliability and operate the units under nuclear safety and security conditions;
- Deploy the plant life management of the Cernavoda NPP components and systems (reactor, steam generator, turbogenerator, etc.);
- Resume the replacement programs for the used and obsolete components and equipments;
- Execute on schedule and at highest quality standards the compulsory annual inspection programs for the critical nuclear components (fuel channels, heat exchangers, etc.);
- Optimise the nuclear fuel and electricity production costs through a sound planning and permanent monitoring of the operation and maintenance expenses;
- Refurbishment of Unit 1 completed in 1996. As a result of the refurbishment, the lifetime of the Unit 1 shall be extended with 25-30 years. The refurbishment preparation process is performed throughout a period of at least ten years, and the major investment efforts shall be allocated during 2020 - 2025. Furthermore, Unit 1 will be completely shutdown for a period of up to two years (scheduled during 2023-2025), when the major works and equipment replacements will occur.

Regarding the **achievement of the major investment objectives:**

- Determine and monitor the investment strategies at SNN level in order to ensure the necessary support for the operation of the units under nuclear safety and security conditions;
- Identify the objectives to be promoted and a realistic long term prioritization in correlation with the SNN possibilities to allocate the required technical, human and financial resources;
- Complete the required feasibility studies and commence works for the major investment objectives.

The Strategic Investment Plan 2015-2025 for Cernavoda NPP si Pitesti Nuclear Fuel Plant is presented in Annex 1.

The Plan identifies the projects to be carried out during this period at Cernavoda NPP and Pitesti Nuclear Fuel Plant and estimates the annual funds required to support the investment plan.

It is worth mentioning that the plan considers Unit 1 Cernavoda NPP refurbishment, the completion of the detritiation installation – Cernavoda Tritium Removal Facility as well as doubling fuel bundle fabrication capacity at Pitesti Nuclear Fuel Plant, thus making available to the company solutions for development and extension of the production capacities.

Also, it is to be emphasized that, out of the total projects identified in the plan, one project will continue beyond the 2015-2025 period, namely the Intermediate Dry Spent Fuel Storage Facility project which is sequentially developed.

Regarding the **improvement of the Company's financial performance indicators:**

- Draft commercial policy and strategy to ensure income predictability and stability considering: support for the production activity and financing capability for the major investment projects; ensure the future income of the Company against electricity price fluctuations (long term contracts); gradual deregulation of the electricity market until 2018;
- Monitor and improve the internal control system, including the compliance with the provisions of OMFP no. 946/2005;
- Expand the integrated management model to the headquarters and the Pitesti Nuclear Fuel Plant branch, with direct results on costs efficiency;
- Optimise the nuclear fuel and electricity production costs through a sound planning and permanent monitoring of the operation and maintenance expenses.

In terms of **ensuring the security of supply of raw materials:**

- Improve the goods, services and works procurement processes through dynamic planning and prioritization, on time and strictly necessary quantities of goods and services through execution of long term contracts;
- Initiate uranium procurement prospects with a view to complement the existing uranium reserves with alternative sources. Furthermore, by the General Shareholders Resolution no. 4 of 29.04.2014, item 5, it was approved to initiate a selection process, on a competitive basis, of a specialized consortium, authorized by the National Registry Office for Classified Information, to provide technical, legal and financial consultancy services, in order to prepare a “Technical, economic and legal study regarding the re-organisation of the mining and processing the uranium ore and the production of nuclear fuel”. The deadline for submitting offers is estimated during the first quarter of 2015.

In terms of **diversification of the portfolio of activities:**

- Identification, assessment and implementation of the portfolio diversification options through strategic investments, in correlation with a realistic long term prioritisation of the technical, human and financial resources of SNN, aiming at sustainable growth of the company in the current competitive electricity market context.

The following options have been identified and are under assessment and/or implementation:

- *Activities in the field of electricity distribution and supply*

Since 2013, SNN has expressed its intention to diversify its portfolio through strategic investments aiming at a sustainable growth of the company in the current competitive electricity market context.

In this framework, SNN is analyzing the opportunity arisen from the announced potential disposal of Enel’s operations in Romania, considering that such a potential acquisition would match the company’s portfolio diversification interests.

- *Tarnita-Lapustesti Pump Storage Hydropower Plant (PSHPP) Project*

According to the Preliminary Agreement regarding the completion of Tarnita-Lapustesti Pump Storage Hydropower Plant (PSHPP) Project, submitted by the Department of Energy with the letter no. 4833/10.05.2013 and to the Memorandum on “Investment Project Tarnita-Lapustesti Pump Storage Hydropower Plant (PSHPP)” approved in the Romanian Government meeting as of 16.10.2013, on November 1, 2013 was set-up the project company Hidro Tarnita SA, having as shareholders Complexul Energetic Hunedoara SA and SC DFEE Electrica SA.

As per the EGSM Resolution no. 1/11.03.2014, SNN shareholders approved the participation of SNN to the share capital increase of Hidro Tarnita S.A. by subscribing a number of 89,000 new shares with a nominal value of RON 100, to be issued by Hidro Tarnita S.A.

Currently, Hidro Tarnita S.A. deploys the investors’ selection procedure with a view to implement the Project („Selection Procedure”). The purpose of the Selection Procedure is to identify/select an investor that will participate into the Project by joining the Company as a shareholder.

- *Romania – Turkey HVDC 400Kv Submarine Power Cable*

In accordance with the Energy Strategy of Romania for 2007-2020, approved by the Government Decision no. 1069/2007, the Romania – Turkey 400Kv submarine interconnection cable represents a key investment aiming to ensure the long term viability of the electricity export for the period 2020-2050, aiming at:

- The power discharge to Turkey, which will indirectly lead to the increase of the electricity production;
- The increase of the National Power System safety;
- The valorification of the electricity surplus produced in Romania on markets outside EU;
- The increase of the attractiveness for the Units 3 and 4 Cernavoda NPP Project.

As per the EGSM Resolution no. 1/11.03.2014, SNN shareholders approved the Preliminary Agreement regarding the completion of the “Romania – Turkey HVDC 400Kv Submarine Power Cable”, endorsed by the Board of Directors and the participation in the set-up of the “HVDC Romania-Turkey S.A.” Project Company by subscription and payment of the equivalent in RON of a number of 2,000,000 shares, having a nominal value of EUR 1. The Property Fund sued SN Nuclearelectrica SA claiming the observance of the absolute annulment of Extraordinary General Meeting of Shareholders Resolution (“EGMS”) no. 1/11.03.2014 and, subsidiarily, to the extent the annulment will not be observed, to rule the cancellation of the EGMS no. 1/11.03.2014.

In terms of **use of the assets that currently do not generate income:**

- Completion of the Units 3 and 4 Cernavoda NPP Project, through capitalization of some existing assets of SNN having a considerable value: land, buildings, equipments etc. – and of EnergoNuclear S.A. – intangible assets, etc, as per the legal requirements.

The Strategy for the continuation of the Units 3 and 4 Cernavoda NPP through organising an investor’s selection procedure (the “Strategy”) has been approved by the Extraordinary General Meeting of Shareholders of S.N. Nuclearelectrica S.A. on 22 August 2014.

The Strategy aims to create a joint venture (“JV”) with the meaning from article 50 of Law no 137/2002, between Societatea Națională Nuclearelectrica S.A. (“SNN”) and a private selected investor, respectively a joint venture, where the amount invested by SNN in Societatea EnergoNuclear S.A. (“EN”) will be transferred. JV represents the company preceding the IPP type company ( Independent Power Producer – IPP), set up for a duration of two years, which can be modified with the parties’ consent, with the purpose of assessing, in the current conditions, the project’s feasibility, the assets’ valuation, deciding upon contracting engineering, procurement and construction works (EPC), obtaining the necessary authorisations and approvals for starting the works and also regarding the support measures that will be granted to the project, given current national and European Community legislation and taking a final investing decision for advancing towards the implementation stage of the Project and later on to the IPP stage.

On 15 October 2014, following the assessment of the submitted Documentation of Intent (investor’s experience in similar projects, financial capability etc.) the company China General Nuclear Power Corporation (“CGN”) has been appointed Selected Investor for the development of the Units 3 and 4 Cernavoda NPP Project (the “Project”), and on 17 October 2014 the Joint Letter regarding the Intention to Complete the Project was signed.

According to the up-dated Indicative Timeline for the Process Implementation, the next phases are:

- negotiate and sign the Memorandum of Understanding regarding the joint implementation of the Project ;
- negotiate the Articles of Association and the Investment Agreement of the new Project Company.

As soon as the negotiations with CGN are finalised, the Memorandum of Understanding regarding the joint implementation of the Project will be submitted for endorsement by the Board of Directors and for approval by the SNN General Shareholders Meeting.

## 2.6. Management Plan 2013-2017

SNN's Extraordinary General Meeting of Shareholders approved on July 24, 2013 the "Management Plan for the period 2013-2017", prepared by the members of the Board of Directors. The management plan presents the company's management strategy during the Board of Directors' mandate, in order to achieve the objectives and performance indicators established in the mandate agreement.

Thus, the main objectives of the Board of Directors for the mandate period are:

- The operation of the nuclear facilities under nuclear safety and security conditions for the personnel, population, environment and production assets;
- Maintaining the electric energy production capacity above the current average industry level;
- The achievement of the major investment objectives;
- The improvement of the Company's financial performance indicators.

The objectives set by management plan and measures for their implementation were developed taking into account (i) the overall positive results of SNN and very good operational performance of the nuclear power plant at Cernavoda, (ii) the specificity and uniqueness of the Company's main object of activity - production of electricity and heat by nuclear processes - in the national economy and (iii) the geopolitical realities and the market (dynamic market environment, the gradual deregulation of the energy market) in which the company operates. Targets of the performance indicators associated with the undertaken objectives are based on the potential analysis which supports the Board of Directors' commitment to place the company among the high productive companies in terms of economic and financial results.

Management plan is monitored in accordance with the provisions of GEO no. 109/2011. In case of circumstances and events beyond the control of SNN, management plan will be amended/modified/completed appropriately, to comply with the level of the performance indicators.

## 2.7. Nuclear Safety Policy

SNN prepared a Nuclear Safety Policy approved by the National Regulator in Romania (National Commission for Nuclear Activities Control) in order to maintain a constant high level nuclear safety in all the phases of the commissioning and operation process of the nuclear installations. The policy guarantees outstanding performance in all activities important for ensuring nuclear safety in all phases of implementation and operation of nuclear facilities and plants. This document confirms the fact that nuclear safety has overriding priority.

The high level of nuclear safety is ensured by the way the nuclear installations are designed, built and operated. Nuclear safety consists of all technical and organizational measures and actions adopted in a nuclear power plant for protecting the population and the environment against release of radioactive substances.

Following the Fukushima accident, the European Nuclear Safety Regulator Group and the European Commission decided that nuclear safety of all EU nuclear power plants should be reviewed based on transparent and extended risk assessments, so called "Stress tests". The technical scope of the stress tests has been defined considering the issues that have been highlighted by the events that occurred at Fukushima.

The focus was placed on the following issues: initiating events like earthquakes and flooding, consequences of loss of safety functions from any initiating events and severe accident management issues.

Cernavoda NPP together with AECL Canada and ANSALDO Italia issued the “Report on nuclear safety margin evaluation”. The evaluation made proves that both Units 1 and 2 from Cernavoda NPP meet the nuclear safety requirements set by the project design and can handle severe earthquakes and flooding, total loss of power supply and cooling water.

Furthermore, methods and procedures were identified as a response to severe accidents. Also, there have been identified ways to prevent and limit the consequences for severe accidents leading to active zone meltdown.

Moreover, a large number of employees take part of various training courses, domestic and abroad, especially those organized by international organizations such as IAEA and WANO. In the same time, the Company is focused on continuous development of the employees especially regarding the nuclear safety, risk management and quality assurance.

## 2.8. Decommissioning strategy

According to Government Decision no. 1080/2007, the Nuclear Agency and Radioactive Waste (“NADR”) is responsible with collecting the contributions paid by SNN for the remaining useful life of Units 1 and 2 and assumed the responsibility for the management of the entire decommissioning process at the end of useful lives of the units, and also for the final disposal of the resulting waste.

During the period 2012 – 2014, SNN annually paid the following contributions towards NADR:

- Contributions for decommissioning of each nuclear reactor in amount of EUR 0.6 /MWh of net electricity produced;
- Contributions for permanent disposal of the radioactive waste in amount of EUR 1.4 /MWh of net electricity produced.

## 2.9. Corporate Social Responsibility (CSR)

SNN has a long lasting reputation for CSR development programs that have made a real impact for the community and for the power plant employees. Even since 1991, through Government Decision 454/1991, the Emergency Social Program for improving conditions for the town of Cernavoda and for the personnel operating and constructing the nuclear power plants has been implemented and was financed through budgetary allocations. Subsequently, an appendix to the Government Decision no. 1081/2003, referring to additional social and cultural projects to be developed for the community of Cernavoda, has been approved.

SNN has prepared and submitted to the Department of Energy, the documentation necessary to endorse a legislative act aiming to regulate the transfer free of charge of the social assets from the property of National Company Nuclearelectrica S.A to the public property of the Cernavoda city and under the administration of Cernavoda City Council and to regulate the legal regime of the ownership right over some of the items listed in the Annex to Government Decision no. 454/1991, as amended by the Annex to the Government Decision no .1081/2003.

CSR was an important part of SNN’s corporate strategy and is expected to remain so for the upcoming period, through the development of CSR campaigns based on real needs of different communities.

## 2. RISK ANALYSIS ON SNN'S CURRENT ACTIVITIES AND DEVELOPMENT STRATEGY

SNN has laid out its environment and long term corporate strategy directions towards maintaining nuclear safety, continuing growth and improving wealth of its shareholders, thus the corresponding risks analysis being crucial in this framework.

On the medium term (2013-2017), the sale of electricity will be affected by the evolution of the electricity prices as well as by the gradual liberalisation of the electricity market. On the long term, the current operations of SNN will be influenced both by the evolution of the electricity prices and by the plans to develop its main investment projects, namely: the refurbishment of Unit 1, the participation to development of Units 3 and 4 Cernavoda NPP Project and/or participation to the development of various strategic diversification investment projects.

Critical risk factors for the long term strategy are represented by the construction and operation of the above projects as well as the evolution of electricity market liberalisation and electricity prices.

As a result, the main risks concerning the SNN activities and objectives (risks related to market and project development) were analysed. The next figure presents an overview of main risks, critical elements of strategy implementation and risks the Company will face.

### Overview of main risks



Source: SNN analysis

### Macro environment

Future profitability of the Company's operations as well as the feasibility of the project are highly dependant on the market environment of Romania and the neighboring countries. Main risk factors associated with the macroeconomic environment are grouped in three main categories, as follows:

### Market risk

Market risk category combines general market risks and risks associated with the Romanian electricity market specifically. It combines effects of the macroeconomic performance, electricity market evolution, and electricity price volatility. Market risk considerations have a direct impact on the overall performance of the Company.

### Regulatory risk

Regulatory risk is represented by the changes that might occur in the regulatory environment of Romania. One way in which such a change could manifest is through the new taxes by the local, central and/or nuclear regulatory authorities. Regulatory risk impacts the Company through unanticipated additional costs, which lead to diminishing margins.

### Currency risk

Currency risks arise from the current activities of the Company as several of them are based on transactions in foreign currency. Such examples include the capital raised for financing the development of the nuclear units (currently EUR, USD, CAD), envisaged uranium imports necessary for the operations of Units 1 and 2 and improvement programs, technical assistance and the decommissioning tax, all are expressed in various foreign currencies. SNN should seek to minimize this risk by implementing hedging mechanisms, either through natural hedges (i.e. matching sales currency and cash flows to the outflow currency) or hedging instruments of commercial banks (ie. swap, forward, futures contracts) as a means to controlling its exposure to unfavourable variations in exchange rates.

## **Operational environment**

Current operations of the Company are subject to different additional risk factors which have a major impact on the current profitability. The main categories of these risks are presented below:

### Operating risk

Operating risks are associated with the Company's course of business, with the ability to generate revenues and maintain a competitive operational margin. These risks are related to the Company's capacity to secure the necessary quantities of electricity in order to cover the contracts established on the regulated and competitive market, and taking into consideration both planned and unplanned outages of both Units 1 and 2. In this respect, nuclear power is generally less exposed to operating risks as compared to gas, coal, hydro and renewables generation assets, given its baseload generation profile. Taking into account that the acquisition of raw materials (heavy water, uranium and technological water) comes from unique suppliers (which are imposed by the State), without a clear pricing methodology in place, there is also a risk associated with the variation of production costs. However, this variation has a moderate impact since the relatively small weight of production costs (excluding depreciation) in total operation cost for a nuclear power plant.

Operating risks also include potential cancelation of contracts concluded on the competitive market, caused by the reduction of current customers' activities, which would lead to a decrease in the need of electricity generation for both Unit 1 and 2. In addition, extended and deep drought and unanticipated technical issues would have a major impact on the generation of electricity through the potential unplanned outages.

One of the factors that can mitigate these risks is reflected in the Company's aims to analyze and consider negotiating long term agreements with a predefined price and specific commercial clauses regarding liquidation and damages, in order to reduce collection period volatility, while securing stable cash flows for operations and investment. Pricing mechanisms available may include "take or pay" contracts and agreements by which the price is split by a "capacity fee" which aims at remunerating SNN for the fixed costs (mainly CAPEX) and a "variable fee" whose purpose is to cover the other costs (fuel, water, etc.).

Other factors mitigating the operating risk could be the ability of the Company to schedule the planned outages in periods when the electricity price is declining or the conclusion of back up contracts in case the Units are not producing enough electricity as a result of unplanned outages.

#### Counterparty risk

Counterparty risk is the risk of business partners` not performing in accordance to the terms and conditions of the concluded agreements. Considering the actual economic downturn, this particular risk can cause major financial difficulties to SNN`s clients, which will be reflected in an increase of the collection period or in the worst scenario, their bankruptcy (finalizing through an increase in overall expenses or losses for SNN). However, historically, the Company has concluded approximately half of its sales on the regulated market. In the context of market liberalisation, SNN will seek concluding long term sales contracts for a larger proportion of its production capacity, this being a condition of ensuring cash flows streams as required by financing institutions. Hence the Company shall develop a policy of selecting customers based on credit risk and therefore engaging contractual arrangements with creditworthy parties.

#### Competition risk

Competition risk must be considered in light of the continuing market liberalization which also facilitates SNN`s acces to selling its output at the higher prices available on the free market. Also, further regional integration is envisaged. SNN will be exposed to increased regional competition and future expected improvements, refurbishments, expansions and new constructions through the producers from the national electricity market. However, as a specific feature of nuclear power generation, the cost of nuclear electricity is expected to remain lower than the cost of coal and gas based facilities which face a high sensitivity to the increasing fuel cost as well as environment compliance regulations (ie. CO<sub>2</sub>). Renewable generation sources, although increasing in Romania and having low production costs given the support schemes in place, are highly volatile in terms of output given the lack of predictability in availaility of the fuel source (ie. wind, solar). Hydro power although cheaper and currently representing approx. 25-30% of the Romanian production remains sensitive to the availability of water. Hence, nuclear electricity is the cheapest form of baseload electricity available.

### **3. CONCLUSIONS AND PRIORITIES 2015-2025**

SNN's Development Strategy for the period 2015-2025 blueprints the way forward, the major initiatives to be implemented as well as the final targets to be met. All such objectives have to be supported, as usual, by a large number of annual and multi-annual plans at branches and departmental levels and it is essential for the entire company to align to a set of priorities that will ensure the success. The following priorities in which one must excel took shape:

#### **I. Human performance and individual accountability**

Individual and organization leadership as well as the individual performance will make in the future the difference between good and excellent. The management team, with all its coordination and supervision links, will have to be built and ready to the major challenge after 2022, when SNN shall have to lead the Unit 1 refurbishment project, while maintaining and enhancing the excellence standards in Unit 2 operation. At the same time, the individual performance to the most leaders have to be maintained or increased and the human resources policy (retirements, natural leaves out of the organization etc) will have to be continuously subordinated to these major requirements in order to maintain a strong, united, with clear vision and objectives organization. All these objectives assert the continuation and even the speed-up or diversification of the initiatives already in progress at Cernavoda NPP – Accountability Model, aggressive observation process, Management Review Meeting process, Oral Board process, personnel rotation process etc.

#### **II. OSART/ WANO/ INPO Review Missions**

During 2015 - 2018 it was requested an IAEA – OSART review in order to allow a refreshed contact with the IAEA specific assessment, while the WANO/INPO reviews will continue. All the annual programs and improvement initiatives that will be developed into the organization shall always have to target excellence. Current and future success will depend on the way each of the employees will demonstrate the sense of “ownership of the problem”, taking the responsibility and team work behavior. It was long since it was understood that no employee could be successful alone because what has to be obtained is simply too much for an individual. The positive WANO/INPO/OSART reviews will represent recognition of SNN worldwide as a top company and will support the initiative to properly honour and reward the employees, the ones that practically obtain the results.

#### **III. Refurbishment of Unit 1 Cernavoda NPP**

The decision to refurbish Unit 1 represents a fundamental pre-requisite for ensuring the balance for a sustainable development. SNN shall responsibly and tenaciously prepare itself in order to demonstrate to the shareholders that Unit 1 refurbishment and implicitly the extension of Unit 1 lifetime by at least 25 years represents an economically feasible option with a major impact on the current and future operation of Units 1 and 2. The year 2018 has to find SNN in an advanced preparation stage of implementation of the shareholders resolution to refurbish Unit 1.

#### **IV. Operation cost control**

The financial management and cost control will remain a constant priority for SNN also in the future. The undergoing works and processes we use will be periodically assessed and reviewed in order to ensure that the costs are optimized, and that the works completed bring substantial “added value” to the company.

## 4. ANNEXES

### Annex 1 – Strategic Investment Plan 2015-2025 for Cernavoda NPP si Pitesti Nuclear Fuel Plant

## 5. REFERENCES

- [1] Romania's Energy Strategy 2015-2035 – draft document subject to public debate
- [2] S.N. Nuclearelectrica S.A. Management Plan 2013-2017
- [3] S.N. Nuclearelectrica S.A. – Business Plan, internal document, 2013.