ROMANIA

(Updated 2012)

1. GENERAL INFORMATION

1.1. Country overview

1.1.1. Governmental System

Government form in Romania is that of a republic, according to the Constitution adopted in 1991 and modified in 2003.

The capital is Bucharest Municipality. It is organized into six administrative sectors. The first documentary mention of the city was on 20.9.1459, as the residence of Vlad Tepes. The capital of Romania since 1862, Bucharest Municipality is the most important political, economic and cultural-scientific center of the country.

- Legislative power is represented by a two-chambered parliament (Chamber of Deputies and Senate), and executive power is held by a government led by the Prime Minister, who is appointed by the country's President
- President of Romania is elected by universal vote based on general election results, for a 5 year mandate.

Official language: Romanian.

Flag of Romania: is three-coloured. The colours are placed vertically in the following order from the lance: blue, yellow, red.

National day of Romania: December 1.

National anthem of Romania: "Wake up, Romanian".

National currency: "RON" (Romanian Leu), "Ban" subdivision.

The exchange rate is set in the interbank currency market on a daily basis, reference currency being the Euro.

Country code: +40

Bucharest code: +40 21

UE membership from 1st January, 2007

NATO membership from 29th March, 2004

Source: National Institute of Statistics

1.1.2. Geography and Climate

Romania is situated in the geographical center of Europe (south-east of Central Europe), north of Balkan Peninsula and halfway between Atlantic Coast and The Urals. The lower course of the Danube passes through Romania for 1075 km, before exiting into the Black Sea. Romania is the twelfth largest country in Europe, with an area of 238,391 km^2.

Romania's Black Sea coastline is 245km long, stretching from Masura stream, at the Ukrainian border, to Vama Voche, at the border with Bulgaria. This coastline provides access to countries in the Black Sea basin, in the Mediterranean Sea basin and, through these, to the rest of the world.

Romania's natural landscape consists of three major levels. The highest level is found in the Carpathians, where the highest peak, Moldoveanu, is 2,544 m. The middle level corresponds to the Sub-Carpathians, to the hills and to the plateaus. Romania's lowest level of relief is found in its plains, meadows and in the Danube Delta. The Danube Delta, the youngest relief unit under permanent formation, has an average height of 0.52 m. Main features of the relief units are their proportionality (31% mountains, 36% hills and plateaus, 33% plains and meadows) and the concentric display of the major relief levels.

Romania's climate is temperate-continental of transition, with oceanic influences from the west, Mediterranean ones from south-west and continental-excessive ones from the east. Multiannual average temperature is latitudinally different, with 8°C in the north and over 11°C in the south, and altitudinally different, with values of -2.5°C in the mountain floor (Omu peak - Bucegi massif) and 11.6°C in the plain (Zimnicea town - Teleorman county).

Yearly precipitations decrease in intensity from west to east, from over 600 mm to less than 500 mm in the East Romanian Plain, under 450 mm in Dobrogea and about 350 mm by seaside. In the mountainous areas they reach 1,000-1,500 mm.

Romanian running waters are radially displayed, most of them having their source in the Carpathians. They are predominantly tributaries of the Danube river, which crosses the country in the south and flows into the Black Sea. There are natural lakes (numerous genetic types) spread in all major units of relief, from glacial ones in the alpine floor (Mioarelor Lake in Fagaras, at 2,282 m) to river-maritime banks (Techirghiol Lake, at 1.5 m) and anthropic lakes.

The vegetation is determined by the relief and by pedoclimatic elements. Mountainous regions are covered by coniferous forests (especially spruce fir), mixture forests (beech, fir, spruce fir) and beech forests. Higher peaks are covered by alpine lawns and by bushes of dwarf pine, juniper, bilberry, red bilberry etc.

In the hills and plateaus, there are broad-leaved forests, of predominantly beech, common oak or durmast oak. The main forest species, often met on low hills and high plains, are Quercus cerris and Quercus frainetto.

The steppe and silvosteppe vegetation, which covered the areas of low humidity in Dobrogea Plateau, Romanian Plain, Moldova Plateau, Banat and Crisana Plain, has been mostly replaced by agricultural crops.

Romania's fauna is grouped according to each species' biotype. Relict elements, such as black goat (chamois) and mountain vulture, live in the alpine area. Various animals live in the Carpathian forests, such as bear, buck, lynx, wolf, wild boar, roebuck, squirrel and several species of bird. In a few mountainous areas, both mountain cock and birch cock are still met. In the hill and field areas, there are hares, moles, hedgehogs, various birds, lizards and batrachian. Rodents such as gopher and hamster are characteristic of the steppe areas. Water fauna is represented especially by trout in the mountainous waters (huck, which was widely spread in the past, has become quite rare), dace and barbel in the hill region, and carp, perch, pike, sheat fish and crucian in the field region and Danube Delta. Sturgeon species are also found in the marine territorial waters and on the downstream Danube.

Romania's **useful minerals resources** are various. They include crude oil, with old exploitation traditions, natural gas, coal, especially coking pit coal, brown coal and lignite, ferrous and nonferrous ores, gold, silver and bauxite ore deposits. There are vast reserves of salt as well as numerous nonmetalliferous resources. A special category of subsoil riches is the over 2,000 mineral water springs, with consumption and medical treatments valences.

Romanian territory is divided, from an administrative viewpoint, into villages, communes, towns, municipalities and counties.

As territorial (non-administrative) units, 8 regions of development were created, gathering several counties.

County represents the traditional administrative-territorial unit in Romania, including towns and communes, and depending on geographical, economical and social-political conditions and on population, cultural and traditional relations. Romania's territory is organized into 42 counties (including Bucharest Municipality).

Municipality is a town with an important economic, social, political and cultural role, usually with an administrative function.

Town represents a human concentration with administrative function and a life specific to urban areas. It has a professional population structure wherein the population is predominantly employed in nonagricultural branches of the economy.

Commune is a territorial-administrative unit which comprises a rural population, united by interest and traditional community, and includes one or several villages (of which one is the commune residence).

Village is the smallest territorial unit, with characteristics of rural settlements.

Main cities: Bucharest, Iasi, Cluj-Napoca, Constanta, Timisoara, Craiova, Galati, Brasov, Ploiesti, Braila, Oradea, Bacau, Pitesti, Arad, Sibiu.

Main harbours:

– at the Black Sea: Constanta, Mangalia

– at the Danube: Moldova Noua, Orsova, Drobeta-Turnu Severin, Calafat, Corabia, Turnu Magurele, Zimnicea, Giurgiu, Oltenita, Calarasi, Cernavoda, Hârsova, Macin, Braila, Galati, Tulcea, Sulina

Main airports: Bucharest ("Henri Coanda"-Otopeni and Baneasa), Constanta ("Mihail Kogalniceanu"), Timisoara ("Traian Vuia"), Cluj-Napoca, Iasi, Arad, Oradea, Baia Mare, Târgu Mures, Suceava, Bacau, Deva, Sibiu, Craiova, Tulcea.

1.1.3. Population

TABLE 1. POPULATION INFORMATION

							Average annual growth rate (%)
Year	1970	1980	1990	2000	2007	2010*	2000 to 2010*
Population (millions)	20.3	22.2	23.2	22.45	21.56	21.43	-0.45
Population density (inhabitants/km²)	85.5	93.2	97.7	94.3	90.43	89.9	-0.46
Urban Population as % of total	36.9	45.8	54.3	54.6	55.1	55.0	0.07
Area (1000 km²)	238.4						

* Latest available data

Source: National Institute of Statistics http://www.insse.ro

1.1.4. Economic Data

TABLE 2. GROSS DOMESTIC PRODUCT (GDP)

					Average annual growth rate (%)
	1990	2000	2005	2010**	2000 to 2010**
GDP (millions of current US$)	39789	37332	99171	164436	34.0
GDP (millions of constant 2000 US$)	42386	37332	49297	55767	4.9
GDP per capita (PPP* US$/capita)	5578	6103	9403	11895	9.5
GDP per capita (current US$/capita)	1715	1664	4586	7673	36.1

* PPP: Purchasing Power Parity

** Latest available data

Source: National Institute of Statistics http://www.insse.ro

1.2. Energy Information

1.2.1. Estimated available energy

TABLE 3. ESTIMATED AVAILABLE ENERGY SOURCES

	Estimated available energy sources					
	Fossil Fuels			Nuclear	Renewables	
	Solid	Liquid	Gas	Uranium	Hydro	Other Renewable
Total amount in specific units*	n/a	n/a	n/a	n/a	n/a	n/a

* Solid, Liquid: Million tons; Gas: Billion m3; Uranium: Metric tons; Hydro, Renewable: TW

1.2.2. Energy Statistics

TABLE 4. ENERGY STATISTICS (GWh)

	1992	2000	2005	2010	Average annual growth rate (%) 2000 to 2010*
Energy consumption**					
- Total	46110	36374	37868	34817	-0.43
- Solids***	10705	7475	8742	6911	-0.75
- Liquids	12196	9808	9163	8416	-1.42
- Gases	20918	13679	13820	10897	-2.03
- Nuclear	-	1338	1362	2850	11.3
- Hydro	1369	1212	1489	1573	2.97
- Other Renewables	922	2862	3292	4170	4.57
Energy production					
- Total	33216	28106	27090	27428	-0.24
- Solids***	7349	5601	5793	5903	0.54
- Liquids	6696	6157	5326	4186	-3.2
- Gases	17336	10968	9536	8705	-2.06
- Nuclear	-	1338	1362	2850	11.3
- Hydro	1007	1272	1739	1769	3.9
- Other Renewables	828	2770	3334	4016	4.5
Net import (Import - Export)					
- Total	13881	7978	10538	7187	-0.99

* Latest available data

** Energy consumption = Primary energy consumption + Net import (Import - Export) of secondary energy.

*** Solid fuels include coal, lignite

Source: National Institute of Statistics http://www.insse.ro

1.2.3. Energy policy

As part of the economic reform measures passed in 1990, the energy sector was reorganized two types of autonomous state enterprise were established: Regies Autonomous (RAs) for the production and supply of energy products, and Commercial Companies (CCs) for support services and activities. This enabled the government to separate policy and regulation from operational functions, to bring accountability, and to institute commercial practices in the energy sector. RAs are state holding-companies for sectors considered strategic by the Government of Romania, including electric power, oil, natural gas, lignite, and coal. CCs are joint-stock companies, established under commercial law.

The energy sector is under the supervision of the Ministry of Economy, Trade and Business Environment, which formulates policies and strategy.

The Government is currently trying to cope with the current global economic circumstances, with increased energy demand and with clarified requirements for a clean and safe environment. The economic context is characterized by deregulation and competition, supported by the industry.

Current government policy aims to develop an energy sector that promotes a market-oriented economy, in accordance with the relevant EU Directives. Following the general elections of December 2008, the new Government Program for 2009-2012 calls for the updating of the national energy strategy, according to the new evolutions and priorities. A new energy strategy is to be accomplished, therefore, by the Ministry of Economy, Trade and Business Environment in the near future.

Furthermore, since the beginning of 2009, following a decision by the Romanian Government, the energy institutional framework restructuring process is still in progress.

The Romanian environment authorities sent the European Commission updated information on the implementation of the “Energy – climate change” package, which was adopted by the European Union by 2008. For Romania, this plan will come into force as of January 2013.

According to the official statistical data for 2007, there were 244 certified environment installations in Romania, and the country’s annual carbon dioxide emissions stood at 74 million tons. A decrease in the number of said facilities and of emissions was found to have occurred over the interval 2008-2009. The national greenhouse gas emissions cap is currently set at 300 million tons a year.

1.3. The electricity system

1.3.1. Electricity policy and decision making process

In 2007, the Romanian government approved a long-term energy strategy, building on the National Energy Strategy on Medium Term.

The government's strategy places emphasis on:

1. increasing energy efficiency
2. boosting renewable energy
3. diversifying import sources and transport routes
4. modernizing lines
5. protecting critical infrastructure.

The strategy aims to create public-private partnerships in different sectors. An example of this can be found in the nuclear field, with the building of two additional units (3 and 4) in Romania's nuclear power plant in Cernavoda.

Romania's overall goal is to become an important electricity exporter and to double power output to approximately 100 TWh by 2020. This amount will be greater than the level of domestic consumption.

A new energy strategy is to be formulated by the Ministry of Economy in the near future.

1.3.2. Structure of electric power sector

The generation, transmission and distribution network consists of the following companies:

1. **Termoelectrica S.A.**, which is the Commercial Company for Electricity and Heat Generation. It is responsible for the production of electrical and thermal energy, and responsible for electricity generation from thermal power plants, district heating, and related fuel supplies. The reorganization process at SC Termoelectrica S.A. continues in a dynamic rhythm, sustained also by government decision 1524/2002 regarding the creation of competitive conditions in the energy production sector.
2. **Hidroelectrica S.A.**, which is the Commercial Company for Electricity Generation and for the production and delivery of hydroelectric power.
3. **Electrica S.A.**, which is the Commercial Company for Electricity Distribution and Supply. SC Electrica S.A. was reorganized in 2002. It is now a group of companies, which includes 8 branches for the supply and distribution of electric energy and 8 branches for maintenance and energetic services. 5 out of 8 distributors had been privatized by 2007.
4. **Nuclearelectrica S.A.** (SNN), which carries out, as its main mission, the production of nuclear power and nuclear fuel and project development at the Cernavoda Nuclear Power Plant site. Nuclearelectrica S.A. has two branches:

- Cernavoda NPP Division, operating Cernavoda NPP Units 1 and 2 and the auxiliary services

- FCN - Pitesti, the Nuclear Fuel Plant that manufactures nuclear fuel for Cernavoda NPP Units 1 and 2

In addition, Nuclearelectrica S.A. is associated with the recently-settled EnergoNuclear S.A. Project Company, responsible for completion of Cernavoda NPP Units 3 and 4.

The whole economic and technical operation and development of the electricity sector will be regulated, ruled, supervised and monitored by the Romanian Energy Regulatory Authority, ANRE. ANRE was created according to the new Electricity Law, set up by a Government Emergency Ordinance in October 1998, as a public institution, both independent and autonomous.

Electricity grid

Romania has an extensive interconnected power transmission and distribution network, with an overall length of about 600,000 km and a total transformer capacity of about 172,000 MVA. The national grid operates on 750 kV, 400 kV, and 220 kV for transmission, and 20 kV, 10 kV, 6 kV, 1 kV and 0.4 kV for distribution.

Transelectrica S.A. is a member of the Union for the Co-ordination of Transmission of Electricity (UCTE) and an observer in the regional group of four transmission system operator companies, CENTREL.

As a limited member of the Interconnected Power System-Central Dispatching Organization, Romania has strong interconnections with Ukraine and Bulgaria, substantial interconnections with the former Yugoslavia, and weaker links to the Republic of Moldavia and Hungary. The Romanian grid operator, Transelectrica, is currently co-operating with the electric power systems of Greece and the former Yugoslavia (both UCPTE members), and is working to become more fully integrated into the UCPTE system. The transmission network is interconnected with those of neighboring countries – by 750 kV (4,000 MWe capacity), 400 kV (2,500 MWe capacity), and two 110 kV tie-lines with Ukraine, a 400 kV line with Hungary (currently operating at 220 kV, with a planned capacity of 1,200 MWe), 750 kV (4,000 MWe capacity), 400 kV (2,500 MWe capacity), and 220 kV (260 MWe capacity) lines to Bulgaria, one 400 kV (1,200 MWe capacity) and two 110 kV lines with former Yugoslavia, and two 110 kV lines with Moldavia. In 2001, Transelectrica received a $51.5 million loan from the European Bank for Reconstruction and Development (EBRD) to upgrade the Romanian transmission system and make it more compatible with the western European power network.

1.3.3. Main indicators

TABLE 5. ELECTRICITY PRODUCTION, CONSUMPTION AND CAPACITY

	1992	2000	2005	2010*	Average annual growth rate (%) 2000 to 2010*
Capacity of electrical plants (GWe)					
- Thermal	16	15	12	12	-2
- Hydro	6	6	6	6	0
- Nuclear	-	0.7	0.7	1.4	10
- Wind	...	...	...	0.4	
- Geothermal	...	...	...	...	
- other renewable	...	...	...	...	
- Total	22	22	19	20	-0.9
Electricity production (TW.h)					
- Thermal	42	32	34	29	-0.93
- Hydro	12	15	20	20	3.33
- Nuclear	-	5	5	12	14
- Wind	...	...	...	0,3	
- Geothermal	...	...	...	...	
- other renewable	...	...	...	...	
- Total (1)	54	52	59	61	1.73
Total Electricity consumption (TW.h)	53	43	50	52	2.09

(1) Electricity transmission losses are not deducted.

* Latest available data

Source: National Institute of Statistics http://www.insse.ro

TABLE 6. ENERGY RELATED RATIOS

	1992	2000	2005	2010*
Energy consumption per capita (GJ/capita)	85	68	73	68
Electricity consumption per capita (kW.h/capita)	2326	1917	2312	2407
Electricity production/Energy production (%)	14	16	19	19
Nuclear/Total electricity (%)	-	10	8	19
Ratio of external dependency (%) (1)	28.0	22.7	28.6	21,2

(1) Net import / Total energy consumption.

* Latest available data

Source: National Institute of Statistics http://www.insse.ro

2. NUCLEAR POWER SITUATION

2.1. Historical development and current organizational structure

2.1.1. Overview

Dates of reference in the Romanian nuclear energy field

- 1976 - The Romanian-Canadian feasibility study for the CANDU system in Romania is completed
- December, 1978 - The contracts between ROMENERGO and AECL, for the takeover of the CANDU system license and for design and procurement of the nuclear equipment for Unit 1, are concluded
- February 1981 - The contracts between ROMENERGO-Ansaldo (Italy) and General Electric (USA) for the conventional part (BOP) of Unit 1 are concluded
- 1982 - First containment concrete is poured (reactor building base slab)
- December 1985 - The delivery on site and the installation of the Calandria vessel for the Cernavodã NPP Unit 1
- 1989 - The installation of the fuel channels at the Cernavoda NPP Unit 1
- December 1989 - Romanian revolution; the Cernavoda NPP Unit 1 is 45% complete
- July 1990 - The first PRE-OSART mission of IAEA-Vienna to the Cernavoda NPP
- August 1991 - The management contract with AECL-Ansaldo Consortium (AAC) is concluded
- May-June 1995 - The fuel loading of the Cernavoda NPP Unit 1
- April 16, 1996 - The first criticality of the Unit 1 reactor
- July 11, 1996 - The first synchronization to the grid of the Unit 1
- December 2, 1996 - The Cernavoda NPP Unit 1 is declared to be in commercial operation
- June 30, 1997 - The transfer of the Unit 1 management and operation responsibilities from AAC to the Romanian personnel
- July 2, 1998 - The setting up of the national company Societatea Nationala Nuclearelectrica S.A.
- September 30, 1999 - The Cernavoda NPP Unit 1 ranks tenth in the world capacity-factor top ten
- February 2003 - Canadian, Italian, French and USA loan agreements are signed with Societe Generale, Credit Lyonnais and Romanian Bank for Development
- March 24, 2003 - The Contract for the Completion and Commissioning of Cernavoda NPP Unit 2 comes into force
- March 30, 2004 - EURATOM Loan is approved by the EC, subject to the implementation of a well-defined improvement package.
- September 21, 2004 - The manufacturing of the nuclear fuel, dedicated to the first load of the Cernavoda NPP Unit 2 Reactor , is started

- September 15, 2005 - The nuclear fuel bundle # 50,000 is manufactured
- December 2005 - The completion of Unit 2's main systems and transfer of procedures to the commissioning team, comprising a total number of 154 systems
- July 2006 - The successful completion of the pressure test at Unit 2
- September 2006 - The loading of the heavy water in the moderator circuit of Unit 2
- November-December 2006 - The completion of more tests at Unit 2 (leak rate test and hot conditioning test)
- December 2, 2006 - The celebration of 10 years of successful operation of Unit 1
- February 15, 2007 - The loading of the first fuel bundle in the active zone of Unit 2 reactor at 01:29 hours
- February 22, 2007 - The completion of the fuel loading into the reactor of Unit 2, 23:25 hours
- March 2, 2007 - The loading of the heavy water into the cooling circuit of the reactor
- May 6, 2007 - The initiation of the chain reaction (criticality) at Unit 2, 23:25 hours
- June 2, 2007 - Six consecutive years of Unit 1 operation have been achieved without any flaw-suspected fuel bundles
- August 2, 2007 - 300 days of operation without interruption at Unit 1
- August 7, 2007 - The first synchronization of Unit 2 with the national power system, at 25% of the reactor's capacity of 700 MWe, 17:21 hours
- September 12, 2007 - Unit 2 reaches full power for the first time, during commissioning tests
- September 12, 2007 - Completion of contractual 10 day operation without an interruption day
- September 28, 2007 - The management of Unit 2 is turned over to SN Nuclearelectrica S.A.
- October 5, 2007 - The official inauguration of Cernavoda NPP Unit 2

Source: SC Nuclearelectrica S.A.

2.1.2. Current organizational chart(s)

The three main institutional pillars of the Romanian nuclear field are:

- **Nuclear Agency and Radioactive Waste** (AN&DR) is a specialized authority of the central public administration, acting as a legal person, co-ordinated by the Ministry of Economy, Trade and Business Environment. The main object of the activities of the AN&DR is to provide technical assistance to the government in devising policies in the nuclear field, as well as to promote and monitor nuclear activities in Romania. AN&DR is the national competent authority, co-ordinating the safe management of spent nuclear fuel and radioactive waste, including final disposal, at a national level.

AN&DR elaborates and monitors the implementation of:

· National Strategy for Nuclear Field Development

· National Nuclear Program

- **National Commission for Nuclear Activities (CNCAN)** is the national competent authority in the nuclear field, exercising the functions of regulation, authorization and control of nuclear activities.

- The national nuclear operator is **Nuclearelectrica S.A.** The shareholders of Nuclearelectrica S.A. are the Romanian State (90.28%) and „Fondul Proprietatea" (9.72%). Its main activities include electrical power and heat production, NPP construction and commissioning, and nuclear fuel fabrication.

2.2. Nuclear power plants: Overview

2.2.1. Status and performance of nuclear power plants

The electricity annually generated by the Cernavoda NPP Units 1 and 2 represents approximately 19% of the overall electricity production of Romania.

TABLE 7. STATUS AND PERFORMANCE OF NUCLEAR POWER PLANTS

Station	Type	Net Capacity	Operator	Status	Reactor Supplier	Construction Date+	Grid Date ++	Commercial Date	Shutdown Date	UCF for 2010	UCF for 2011 **
CERNAVODA UNIT 1	PHWR	706.5	SNN	Operational	AECL	1982	11 Jul 1996	02 Dec 1997		91.53	99.67
CERNAVODA UNIT 2	PHWR	706.5	SNN	Operational	AECL	1982	07Aug 2007	05 Oct 2007		97.24	91.07

* UCF (Unit Capability Factor) for the latest available year (only applicable to reactors in operation).

** Latest available data

+ Date, when first major placing of concrete, usually for the base mat of the reactor building is done.

++ Date of the first connection to the grid

Source: Source: SC Nuclearelectrica S.A PRIS database (www.iaea.org/pris).

2.2.2. Plant upgrading, plant life management and license renewals

Cernavoda Unit 1, having been in operation since December 1996, started the development of the Plant Life Management (PLiM) Programme. Due to its complexity, the programme plan has been divided into several subprogrammes and pilot projects, and integrated with other initiatives for improvement to the long-term strategy of Cernavoda NPP (2004-2008), managed effectively by annual Station Technical Programmes.

The overall PLiM programme is designed to meet the needs of Cernavoda Unit 1 for a structured work programme, and will be implemented in phases. This phased approach will provide the information required for input into its cost model for plant economic assessments.

Source: IAEA TECDOC 1503

2.3. Future development of Nuclear Power

2.3.1. Nuclear power development strategy

Further nuclear power capacity

In 2002, efforts got under way to resume work on Cernavoda Unit 3. Nuclearelectrica S.A. commissioned a feasibility study from Ansaldo, AECL and KHNP (S. Korea) in 2003.

In August 2004, the government advertised for companies interested in the completion of Cernavoda Unit 3, a 700 MWe Candu 6 unit, through a public-private partnership arrangement. This proved impractical, and a feasibility study in March 2006 analyzed further options for both Units 3 and 4.

Main foreseen characteristics of Cernavoda NPP Units 3 and 4 are:

Reactor Type: CANDU 6

Installed Output: 2 x 720 MWe

Delivered Power: 2 x 5,239 TWh/year

Schedule: 64 months per unit

Unit Life: 30 years, possible 40

Electricity Price: 28.2-32.5 Euro/MWh

Policy for nuclear fuel cycle

Current policy is for a once–through nuclear fuel cycle without reprocessing

Strategy for funding long term spent fuel handling and final disposal, waste management and decommissioning

The Unit 2 (CANDU 6 PHWR) from Cernavoda NPP started operation at the end of 2007. Because there is a difference in operation between the two NPPs of eleven years, and to finalize the decommissioning at the same time, Unit 1 was assigned the SAFESTORE strategy for decommissioning (31 years from shut-down to release from CNCAN control) and Unit 2 the DECON strategy for decommissioning (20 years from shut-down to release from CNCAN control). It is expected that each unit will operate for about 40 years. The decommissioning of Unit 2 is scheduled to begin in 2054. In 2067, after 7 years of preparation in the transition period from operation to decommissioning will be completed.

New Nuclear Power Plant in Romania

The construction of a new NPP after 2020 is under consideration.

2.3.2. Project management

The annual production of a CANDU 720 MWe nuclear unit is steady, with output amounting to about 5.2-5.4 TWh (gross). This leads to an equivalent yearly reduction of roughly 1.4 million tons of oil, representing more than 100 millions USD, and the associated decrease in noxious emissions.

The “Strategy” states that, given present conditions in Romania and taking into account the cost of energy from nuclear plants versus the costs of fossil fuel power plants, investment should continue for the next units of Cernavoda NPP.

In addition, sites are currently being considered for a second nuclear-power plant.

At present, R&D programs are addressing problems regarding: the nuclear safety and physics of nuclear reactors, testing of nuclear materials and equipment, development of new concepts of nuclear fuel cycles and advanced reactors, decommissioning (the VVR-S research reactor from Bucharest-Magurele is preparing the decommissioning process), management of nuclear waste, and protection of environment.

2.3.3. Project funding

The project company **EnergoNuclear S.A.** was established by Governmental Decision no. 1565/2008, and consists of Nuclearelectrica S.A. and private investors. The current Romanian Government Program states that the selection of new investors and re-negotiations will occur within a public-private partnership.

2.3.4. Electric grid development

No data available.

2.3.5. Site Selection

No data available.

2.4. Organizations involved in construction of NPPs

Cernavoda NPP Units 3 and 4 – Project Development Activities

For the completion of Cernavoda NPP Units 3 and 4, the new project company, **EnergoNuclear S.A.,** which was established through the Governmental Decision no. 1565/2008, announced two phases of the project:

- **the pre-project phase:** this is estimated to last 18 months from the registration of the Project Company, and will have a budget of 30 million Euro as a result of shareholder subscriptions and payments. During this period, the investors will conclude the commercial arrangements for the construction of the reactors, their long-term operation and the financing methods. During these 18 months, the necessary approvals from the European Commission for construction must also be obtained

- **the project phase:** this is the period in which each investor will contribute to covering the costs of the project with an amount relevant to the share owned in the social capital of the company.

2.5. Organizations involved in operation of NPPs

National Company Nuclearelectrica S.A., the owner and operator of Cernavoda NPP, was founded by Governmental Decision no. 365 in July 1998. CNE PROD Cernavoda, a subsidiary of Nuclearelectrica S.A., is responsible for operating the Cernavoda Units 1 and 2.

There is another subsidiary of Nuclearelectrica S.A., the Nuclear Fuel Plant in Pitesti–Mioveni. This is the local manufacturer of CANDU-type nuclear fuel for the Cernavoda Units 1 and 2. CNE PROD has its own maintenance division and a Training Center with a full scope simulator.

2.6. Organizations involved in decommissioning of NPPs

No available data

2.7. Fuel cycle including waste management

Nuclear fuel cycle policy: Open nuclear fuel cycle

Mining:

Uranium mining activities started in Romania in 1952. The National Uranium Company (CNU) is the representative of the State in this activity, and has three uranium mining branches (EM): Bihor - EM Bihor, Banat - EM Banat, and Suceava - EM Crucea.

Milling and conversion:

Uranium ores are processed by the Feldioara plant, which is operated by CNU. The Feldioara processing plant has two modules:

- ‘R’ type module for uranium milling and concentration (nominal capacity 300 t $U(U_3O_8)/y$)

- ‘E’ type module for uranium refining and conversion to nuclear grade UO_2 (nominal capacity 300 t $U(UO_2)/y$).

Both modules are in operation, but the production capacity is reduced to about 100 t U(U_3O_8)/y for the R plant, and on request (by the Pitesti Fuel Fabrication Plant (FCN Pitesti)) for the E plant. The Feldioara processing plant has been qualified by AECL as a CANDU UO_2 fuel supplier.

Enrichment:

Spent fuel produced by Cernavoda NPPs is not reprocessed

Fabrication:

The Nuclearelectrica S.A. operates FCN Pitesti. The present capacity of FCN Pitesti (110 t U/y) will be increased in accordance with Cernavoda NPP requirements. FCN Pitesti has been qualified by AECL as a CANDU fuel supplier.

The nuclear fuel needed for operation of the Cernavoda NPP Units 1 and 2 is supplied by the Nuclear Fuel Plant from Pitesti. In 2007, FCN obtained the TUV EN ISO 14001:2004 certificate for its management system. The capacity of the plant enables it to provide the annual amount of fuel necessary for Unit 1 and 2 operation. With small investment to extend its production capacity, it will be able to meet the requirements of the operation of four units.

Heavy water production:

The Romanian Authority for Nuclear Activities operates the ROMAG PROD Heavy Water Plant (design capacity 360 t/y).

Spent fuel management:

Romania's objective is to ensure the safe management of radioactive waste, including spent fuel, according to the provision of laws and regulations assuring the protection of human health and the environment, including the protection of future generations.

Romanian radioactive waste producers are:

1. Cernavoda NPP:

- Unit 1 - in operation since December 1996

- Unit 2 – commissioned in 2007

2. Research reactor:

    - Nuclear Research Institute (SCN) from Pitesti

3. Medicine, agriculture, industry

Cernavoda NPP current waste management:

- The gaseous and aqueous liquid waste is collected, filtered/purified by designed systems and then safely released/discharged into the environment.

- Organic liquid waste is pretreated (collection and segregation by interim storage criteria), treated (absorption into polymeric structure), packaged in stainless steel drums and stored in an interim storage facility.

- Solid radioactive waste management at CNE Cernavoda includes the pretreatment (collection, segregation), treatment (volume reduction by compaction or shredding) and safe storage of the waste.

The current capacity of the concrete building that accommodates solid radioactive waste (storage facility at Cernavoda NPP) is for 46 reactor-years.

After extraction from the nuclear reactor and during the first “cooling down” stage, spent fuel is stored on racks under water in the spent fuel bay, placed near the reactor building. After 6 years, the spent fuel can be transferred to a dry place, the Intermediate Spent Fuel Storage facility (DICA).

The Cernavoda NPP DICA has been constructed based on AECL technology, adapted to the Cernavoda conditions. The first module was commissioned in May 2003, and at present there are 3 modules already erected on the site. The site is licensed so that the total storage capacity (27 MACSTOR modules) can accommodate the spent fuel produced by Unit 1 and Unit 2 for a 50 year storage period. The site could be extended to accommodate the spent fuel produced by all 4 units from Cernavoda NPP.

Research reactors radioactive waste:

Nuclear Research Institute (SCN) from Pitesti: According to the Agreement signed between Romania and USA, the HEU type fuel has already been returned to USA.

Institutional radioactive waste:

The processing and conditioning of the institutional radioactive waste is done by IFIN-HH and SCN Pitesti on the research reactor sites at Bucharest and Pitesti, in the respective Treatment and Conditioning facilities. IFIN-HH is responsible for the transport of conditioned institutional radioactive waste to the National Repository for Radioactive Waste (DNDR), which is located at Baita Bihor. The first waste disposals were made in 1986, and the current estimate is that disposals will continue until 2040. The repository is currently operated by IFIN-HH.

The National Strategy on Medium and Long Term Management of Spent Nuclear Fuel and Radioactive Waste, including the Disposal and the Decommissioning of Nuclear and Radiological Facilities, provides:

- L&ILW Surface Repository by the end of 2020

- HLW Deep Geological Repository Facility by the end of 2055

- safety and technical characteristics of BAITA-BIHOR Repository improvement

In the long–term, the liability concerning the final repository for radioactive waste and spent nuclear fuel rests with the "**Nuclear Agency & Radioactive Waste**", set up in 2009.

2.8. Research and development

2.8.1. R&D organizations

The **Ministry of Education, Research, Youth and Sports**, the new governmental organization, co-ordinates the activity of most R&D organizations and institutes through the National Authority for Scientific Research.

The **Ministry of Economy, Trade and Business Environment** is the responsible authority for the definition of national participation policies and strategies, for planning and co-ordination of the national nuclear industry activity, representing the State as a shareholder of nuclear assets, and for co-ordination of part of major R&D and engineering facilities. It also has primary responsibility for the safety of its nuclear installations, which is assured through the following organizations:

Romanian Authority for Nuclear Activities (RAAN), through the Nuclear Research Institute (SCN) Pitesti, is the operator of the TRIGA type research reactor, the hot cell facility and the radioactive waste treatment facility at the Pitesti-Colibasi site. RAAN, through the Center of Technology and Engineering for Nuclear Projects (SITON), is also in charge with support design activities in the nuclear field and, through the Heavy Water Plant (ROMAG-PROD) located in Drobeta Turnu-Severin, of covering the heavy water needs of the Cernavoda NPP.

Research establishments

Nuclear Research Institute (SCN) Pitesti, under the Romanian Authority for Nuclear Activities (RAAN)

The Nuclear Research Institute (SCN) is consistently involved in the work associated with the national nuclear safety programs: nuclear fuel, reactor physics, radiation protection, generic CANDU technologies, management of radioactive waste and TRIGA reactor conversion. Almost all of the Institute's activities were oriented towards providing scientific and technical support for the Nuclear Power Program in Romania. The major SCN R&D Programs are focused on:

- Nuclear safety, to ensure the technical and scientific support needed for the safety assessment of Cernavoda NPP during its lifetime

- Nuclear fuel, to elaborate technology and new methods to optimize fuel utilization in Cernavoda NPP
- Radiation protection, to integrate all aspects regarding ecological impact of nuclear power and to develop techniques for operating nuclear installations based on ALARA principles
- CANDU technologies intended to ensure an optimized maintenance of NPP systems and components;
- Radioactive waste management, to solve the problem of radioactive waste generated by nuclear facilities in accordance with national legislation and international standards
- Radioisotopes and irradiation techniques

Center of Technology and Engineering for Nuclear Projects (SITON) Bucuresti-Magurele, under the Romanian Authority for Nuclear Activities (RAAN)

SITON supports the nuclear programme in Romania with a large range of services under a regime of quality assurance, through using internationally-recognized codes and standards (ASTM, ASME, IEEE, ISI, IEC, CSA series and IAEA guidelines etc.). SITON services cover the following:

- detail design for process and support systems associated with a CANDU-600 NPP, as well as civil design for the reactor building, the turbine hall, the service building, spent fuel and waste management and detail design for adjacent installations and support systems for nuclear research reactors and labs
- reliability and probabilistic assessment studies
- nuclear safety analyses, including environmental impact analyses in case of accidents, fires, earthquakes, flooding etc.
- thermohydraulic calculations and stress analyses for various working regimes, using specialized computer programmes
- methodologies for computation and computer-assisted design
- technical and economic studies for siting as well as cost estimates for new designs and for operational design modifications for NPP systems and components
- technical assistance for equipment fabrication, installation, testing and commissioning as well as for the testing and commissioning of process systems
- land registering and requirements for area classification
- analyses and optimizations of power consumption
- prognoses regarding the national power-system development, especially nuclear power trends

Institute of Physics and Nuclear Engineering "Horia Hulubei" (IFIN-HH) Bucuresti-Magurele, under the co-ordination of the National Authority for Scientific Research (ANCS)

The Institute of Physics and Nuclear Engineering performs research activities in the nuclear field and on radioactive waste treatment, and is the owner of the type VVR-S research reactor and the national LL and IL radioactive waste repository. It also operates the multi-purpose irradiation facility. Its main activities are focused on:

- Nuclear technologies
- Technological irradiation using neutrons, gamma rays and charged particles
- Neutron activation analysis; X-ray fluorescence

- Industrial defectoscopy
- Magnetic resonance and tomography
- Methods, instruments and devices using radioactive sources
- Tracer applications to hydrology and geology
- Radiochemistry; polymerization in radiation fields
- Radio-pharmaceutical production
- Nuclear radiation metrology
- Primary and secondary standards
- Etalons for use in the field of nuclear radiation research and applications
- Quality assurance and control
- Neutron metrology
- Radiation biophysics and biochemistry
- Low-dose irradiation effects on biological systems
- Interaction of nonionising radiation with living systems
- Cytotoxic effects due to internal contamination with tritium
- Non conventional biochemical techniques: RIA, EIA, ELISA, biosensors
- Pharmacology of labeled components of medical use and of U and Th compounds
- Metallic pollutants in biological structures
- Biokinetics of radionuclides and whole body monitoring
- Radioecology
- Development of a decision support system for nuclear emergency
- Techniques and procedures for radioactive and chemical pollutants
- Transfer mechanisms and ecological lifetime of radionuclides
- Models for transfer and dose prediction of radionuclides
- Use of radioactive tracers in agriculture and the environment
- Environmental transfer and conversion of tritium from CANDU reactor
- Nuclear risk assessment for the public and environment
- Nuclear medicine
- Computerized tomography
- Automatic systems for medical diagnosis
- Apparatus and devices for nuclear medicine and environment monitoring
- Software for nuclear medicine and environmental applications
- Nuclear energy
- Nuclear instruments
- Non-fuel cycle radioactive waste collection, treatment, conditioning, interim, storage and disposal
- Nuclear data
- Computation methods
- Decontamination and decommissioning of nuclear facilities
- Instrumentation for nuclear research and technologies
- Gas detectors for applications in industry and medicine
- Detectors for radiation dosimetry and environmental radioactivity
- Data acquisition systems
- Modular electronic equipment for research and application in industry
- NMR and EPR methods and instrumentation
- Magnetometers for space applications

National Institute of Research and Development for Isotopic and Molecular Technologies (ITIM), Cluj-Napoca

ITIM is an institute for scientific research and technological development, under the co-ordination of the National Authority for Scientific Research (ANCS).

The research activities of the Institute for Isotopic and Molecular Technology are pointed in several significant directions:

- Stable isotope physics
- Selective excitation in laser radiation field
- Low temperature distillation (-196°C, liquid nitrogen) for the separation of oxygen, carbon and boron isotopes
- Chemical isotopic exchange
- Thermal diffusion;
- Synthesis of stable isotopes labeled
- Analytical methods and instrumentation
- Stable isotopes separation and labeled compounds
- Separation of oxygen and carbon isotopes by cryogenic distillation
- ^{15}N Labeled compounds
- Environment survey and protection
- Separation of uranium from radiation-contaminated waters
- Methods for geological characterization of rocks, with stable isotopes
- Determination of highly sensitive counting technique for long-life radionuclides, determination applied in radioecology and dating

National Research Institute of Cryogenics and Isotopic Separations (ICSI), Ramnicu Valcea

ICSI is an institute for scientific research and technological development, under the co-ordination of the National Authority for Scientific Research (ANCS). It was founded with the aim of researching and verifying the technologies for heavy-water separation and further treatment of tritium. The principal directions of its activities are:

- Research into equilibrium and hydrogen isotope (tritium, deuterium) separation processes, inclusive of the industrial pilot plant level
- Research and development of cryogenic processes, equipment, and, specifically technologies and experimental stands
- Research into the equilibrium and gases separation process of purification and forward recovery technology
- Achievement and development of advanced materials as adsorbents, catalysts, composites and fullereness
- Development of methods, apparatus and equipment for control of isotopic separation processes and achievement of cryogenic temperatures
- Development of static and dynamic equipment specifically for isotopic separation processes
- Direct utilization of own research in production (ultra pure gases, gases and gas mixtures, equipment, sodium sulphide, analysis apparatus, risk studies, expertise)

- Technology transfer

National Institute for Laser, Plasma and Radiation Physics (INFLPR), Bucuresti-Magurele

The National Institute for Laser, Plasma and Radiation Physics performs research activities in laser physics, plasma physics, and physics of electron beams, under the co-ordination of the National Authority for Scientific Research (ANCS). The main research and development activities are focused on:

- Fusion plasma physics, theoretical studies and numerical simulations of the plasma evolution in tokamak devices
- Physics and technology of plasma produced by high-power particle beams and X-radiation in ultra fast transient plasmas
- Plasma surface engineering
- Crystal growth by plasma methods

National Institute of Research and Development for Technical Physics (IFT), Iasi

The research activity of the National Institute of Research and Development for Technical Physics, under the co-ordination of the National Authority for Scientific Research (ANCS), is directed in several significant directions:

- Magnetic materials and devices
- Special alloys and hard magnetic materials
- Magnetic separation and high Tc superconductivity
- Magnetometry and magnetic detection
- Non-destructive control

2.8.2. Development of advanced nuclear technologies

Taking into consideration the selection of a proper site for a new nuclear power plant in Romania, the construction of a Generation III reactor is most likely. Furthermore, all studies concerning the new site selection and future technology are still in progress.

Romania also participates in international programs concerning advanced reactor systems, such as INPRO.

2.8.3. International co-operation and initiatives

In the nuclear field, international co-operation mainly aims at ensuring the safety and reliability of nuclear facilities. For this goal, Romania is carrying out active co-operation activities consisting of: information exchange, training courses and international meetings, elaboration of studies, expertise, design, tests, research and common regulations, thereby enhancing and sharing their

experience and know-how. All these contribute to a permanent improvement of the qualifications of personnel.

IAEA provides Romania with technical assistance through a Country Programme Framework, aiming to identify and address short- and medium-term objectives and interests, and national development priorities. Nuclear Agency is the National Contact Point for the Technical Co-operation with IAEA.

Romania is an active participant in the technical co-operation regional, European and international programmes in the following areas: strategic planning for sustainable development of nuclear institutions, research reactors, radiation medicine, isotopic technologies for water resources, NPP Probabilistic Safety Assessment, radioprotection and nuclear techniques used in agriculture. Romania participated in the 2009-2011 TC Cycle in 35 regional projects, and is co-ordinator for three of them. Some of the beneficiary institutions are: IFIN-HH, CNCAN, AN&DR, Nuclearelectrica and SCN-Pitesti.

Following the U.S. Secretary of Energy's announcement of the **Global Threat Reduction Initiative** (GTRI), in 2004, the IAEA initiated a Technical Co-operation project ROM/4/024 to enable the safe operation of the TRIGA 14-MW reactor from SCN Pitesti during the gradual and complete conversion from HEU to LEU fuel. The IAEA project was originally approved in 1999, but became active in 2003, with the receipt of extra budgetary contributions totaling $3.6 million from the U.S. and $0.5 Million from Romania. The total project cost was $4.4 million, with IAEA contributing $0.3 Million and taking the co-ordinating role.

In September 2007, Romania became an active member of the **Global Nuclear Energy Partnership** (GNEP) by signing the Declaration of Principles. The outstanding importance of this Partnership resides in the strengthening of nuclear safety and nuclear risk mitigation through a balanced promotion of R&D development and partnership in international policy. Romania is represented in the steering committee and working groups.

Romania also joined the **Global Initiative to Combat Nuclear Terrorism** (GI), in 2007. Signing the GI Declaration of Principles, Romania ceded all legal instruments needed for prevention of nuclear terrorism acts: prevention, early detection, combating and investigation. Romania is represented in the organizing committees of the working groups. Romanian scientists are actively involved in international research projects, such as: INPRO, ITER, GIF, Framework Programme 7 EURATOM, JRC and CERN. Many of them are also associated with projects developed within the international research network or in co-operation with international research institutes (e.g. Joint Institute for Nuclear Research DUBNA).

Nuclearelectica SA is an active member of international specialized organizations and entities, such as **WANO**-Atlanta Center (World Association of Nuclear Operators) and **COG** (CANDU Owners Group), benefiting from a continuous exchange of experience in the field.

Nuclearelectrica SA is also a member of the World Nuclear Association (**WNA**) and Electric Power Research Institute **(EPRI**). It has developed an effective and large partnership within IAEA European regional co-operation programs.

Under IAEA's aegis, Romania grants technical assistance to nuclear specialists from developing countries that operate CANDU nuclear power plants or intend to start or enlarge nuclear programs.

2.9. Human resources development

The complexity and risk level of the facilities and equipment of a nuclear power plant require high-quality manpower and its preservation throughout time. To this end, Romania considers the work performed in the human resources field a priority. Special attention is paid to the strategy relating to personnel recruitment and personnel loyalty/job stability, as well as to the sustained improvement of training and specialization quality. This is accomplished both through analyzing the work of that particular domain and through application of the provisions under the Collective Labor Agreement, that is adapted to the relevant requirements and to the laws in force.

The main activity and concern within the human resources area has been and continues to be personnel recruiting and job stability. This has been alleviated by applying some strictly-established selection criteria regarding personnel specialization, as well as by applying a remuneration system focused mainly on jobs specific to the nuclear domain.

The training of personnel working in the nuclear field is focused on the attributions of each category of jobs, and provides the knowledge necessary for performing activities safely and efficiently. The personnel are trained both inside the companies/institutions, through on-the-job training courses and workshops, and outside them, through participation in national and international conferences, symposia, workshops and other events within the programs organized by IAEA-Vienna and by other national and international organizations.

Two personnel training centers have been established:

- Nuclear Training Centre - Department within IFIN-HH, Magurele, Bucharest. Develops activities related to the qualification and/or specialization of personnel for nuclear applications or other related fields. CPSDN activity is carried out in compliance with a Quality Management System certified in accordance with EN ISO 9001:2000 by TUV HESSEN, through TUV CERT certification body.
- Cernavoda Training Center at Cernavoda NPP, developed with IAEA technical support, runs nuclear safety and security training programs

2.10. Stakeholder Communication

No available data

3. NATIONAL LAWS AND REGULATIONS

3.1. Regulatory framework

3.1.1. Regulatory authority(s)

The **National Commission for Nuclear Activities Control (CNCAN)** is the national competent authority in the nuclear field, exercising the powers of regulation, authorization and control, as provided under the Law 111/1996 (on the safe deployment of nuclear activities, republished).

The **Ministry of Environment and Forests** is responsible for environmental protection legislation and regulations, and for the licensing process from an environmental protection point of view.

The **Ministry of Economy, Trade and Business Environment** co-ordinates the Pressure Vessel Authority (ISCIR), which is responsible for licensing and control of pressure vessels, boilers and other pressure installations, including those from the nuclear field.

The Ministry of Public Health is the authority responsible for organizing the monitoring network for contamination with radioactive materials of food products throughout the whole food chain, including drinking water as well as other goods designated to be used by the population, according to the law. It is also responsible for the epidemiological surveillance system of the health conditions of personnel who are professionally exposed, and of the hygiene conditions in units in which nuclear activities are deployed.

The Ministry of Administration and the Interior is responsible for control of fire protection at nuclear installations and for supervision of the physical protection of nuclear installations and nuclear material.

The Ministry of Public Finance is the authority in charge of providing and controlling financial support from governmental budgetary funds.

3.1.2. Licensing Process

Since December 2000, CNCAN is an independent governmental body. The president of CNCAN is a Secretary of State. CNCAN is responsible for full surveillance and control in all issues relevant to nuclear safety regarding siting, construction, commissioning, operation of nuclear plants, research reactors and all nuclear facilities in Romania. In addition, CNCAN is charged with full surveillance and control in all issues relevant to quality assurance, radiation safety, safeguards, export/import control, physical protection and emergency preparedness, and monitoring the radioactivity of the environment. CNCAN is the National Counterpart to the IAEA for nuclear safety, radiation safety, safeguards, physical protection, emergency preparedness, illicit trafficking events reporting, IRS and INES reporting systems and Safety Convention

reporting activities. CNCAN plays the role of regulatory body integrator in the licensing process of nuclear installations.

3.2. Main national laws and regulations in nuclear power

- Law no. 43/1995 for ratification of the Convention on Nuclear Safety, adopted by IAEA in June 17, 1994
- Government's Ordinance no. 195/2005 on environmental protection, with the subsequent changes and completions
- Law no. 111/1996 on the safe deployment, regulation, authorization and control of nuclear activities, republished
- Law no. 105/1999 for ratification of the Joint Convention on Safety of Spent Fuel and on the Safety of Radioactive Waste Management
- Law no. 100/2000 for the ratification of the Protocol between Romania and IAEA, additional to the Agreement between Romania and IAEA for the application of the safeguards connected to the Treaty for the nonproliferation of the nuclear weapons
- Law no. 703/2001 regarding the Civil Liability for Nuclear Damages, with the subsequent changes and completions
- Government's Decision no. 1259/2002 for the approval of the National Strategy for the development of the Nuclear Field in Romania and of the Plan of Action for the Strategy
- Government's Decision no. 437/2002 for the approval of the setting up of Interdepartmental Committee to restart and to complete the workings regarding Unit 3 and 4 from CNE Cernavoda, with the subsequent changes and completions
- Government's Decision no. 890/2003 regarding the approval of the "road map of the power field in Romania", with the subsequent changes and completions
- Law no. 193/2003 for the completion of Law no. 111/1996 on the safe development of nuclear activities
- Government's Ordinance no. 11/2003 on the safe management of radioactive waste – republished
- Government's Decision no. 1568/2003 regarding the amount of direct annual contributions of nuclear permit holders and the deadline for their payments
- Government's Decision no. 1627/2003 for the approval of the Regulations of organization and functioning of the National Commission for Nuclear Activities Control, with the subsequent changes and completions
- Government's Decision no. 1601/2003 regarding the organization and functioning of the National Agency for Radioactive Waste
- Government's Ordinance no. 7/2003 regarding the use of nuclear energy in exclusively peaceful purposes, with the subsequent changes and completions
- Government's Decision no. 97/2005 for the approval of the Agreement between the Nuclear Agency of Romania and the National Commission for Nuclear Activities Control of Romania and the Department of Energy of the United States of America concerning co-operation in the

area of countering the proliferation of nuclear materials and technologies

- Law no. 360/2005 regarding the payment of the financial obligation of Romania to the International Atomic Energy Agency
- Law no. 57/2006 for changing and completions of the Government's Ordinance no. 7/2003 regarding the use of nuclear energy in exclusively peaceful purposes
- Government's Decision no. 267/2007 for the approval of the Regulations of organization and functioning and of the structure of the Nuclear Agency
- Government's Decision no. 643/2007 regarding the approval of the Strategy for selecting the investors for Unit 3 and 4 from CNE Cernavoda
- Government's Decision no. 957/2007 regarding the changing and completions of the Government's Decision no. 437/2002 for the approval of the setting up of Interdepartmental Committee to restart and to complete the workings regarding Unit 3 and 4 from CNE Cernavoda
- Government's Decision no. 923/2008 regarding the changing of the Government's Decision no. 267/2007 for the approval of the Regulations of organization and functioning and of the structure of the Nuclear Agency
- Government's Decision no. 691/2008 for changing and completions of the Government's Decision no. 634/2007 regarding the approval of the Strategy for selecting the investors for Unit 3 and 4 from CNE Cernavoda
- Government's Decision no. 1437 of 2009, November 18**,** regarding the approval of the organization and functioning Regulation and of the organizational structure of Nuclear Agency & Radioactive Waste

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APPENDIX 1: INTERNATIONAL, MULTILATERAL AND BILATERAL AGREEMENTS

List of international conventions and bilateral agreements signed/ratified by Romania in the field of nuclear power:

Main International Treaties

Title	In Force	Status
Treaty on the Non-Proliferation of Nuclear Weapons (NPT)	1970-02-04	Signature: 1968-07-01
Agreement on the Privileges and Immunities of the IAEA	1970-10-07	Acceptance: 1970-10-07
Convention on the Physical Protection of Nuclear Material	1993-12-23	Signature: 1981-01-15 Ratification: 1993-11-23
Vienna Convention on Civil Liability for Nuclear Damage	1993-03-29	Accession: 1992-12-29
Convention on Early Notification of a Nuclear Accident	1990-07-13	Accession: 1990-06-12
Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	1990-07-13	Accession: 1990-06-12
Convention on Nuclear Safety	1996-10-24	Signature: 1994-09-20 Ratification: 1995-06-01
Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention	1993-03-29	Accession: 1992-12-29
Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	2001-06-18	Signature: 1997-09-30 Ratification: 1999-09-06
Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage	2003-10-04	Signature: 1997-09-30

		Ratification: 1998-12-29
Convention on Supplementary Compensation for Nuclear Damage		Signature: 1997-09-30 Ratification: 1999-03-02
Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the IAEA (RSA)	1981-10-28	Signature: 1981-10-28
Amendment to the Convention on the Physical Protection of Nuclear Material		Ratification: 2007-02-06
Euratom Treaty	2007-01-01	Since January 1st 2007 Romania is member of EU
IFNEC Global Nuclear Energy Partnership Steering Group Members Approve Transformation to the International Framework for Nuclear Energy Cooperation Department of Energy - U.S. Department of Energy		Approved: June 18 2010

Safeguards Agreements

Title	In Force	Status
Application of safeguards in connection with the Treaty on Non-Proliferation of Nuclear Weapons	1972-10-27	Signature: 1972-03-08
Protocol between Romania and the IAEA Additional to the Agreement between the Socialist Republic of Romania and the IAEA for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons	2000-07-07	Signature: 1999-06-11

Other relevant international treaties and documents

Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water	In force:	23 December 1963
Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-Bed and the Ocean Floor and in the Subsoil Thereof	In force:	10 July 1072
Comprehensive Nuclear-Test-Ban Treaty	In force:	5 October 1999
Improved procedures for designation of safeguards inspectors	Accepted in statement to Board of Governors:	22 February 1990
Nuclear Export Guidelines	Adopted	

Committees and Groups

1. Zangger Committee – Member
2. Wassenaar Arrangement – Member
3. Australia Group – Member
4. Nuclear Suppliers Group – Member

5. Joint Institute for Nuclear Research, Dubna, Russian Federation

6. International Framework for Nuclear Energy Cooperation (IFNEC) – member

7. Global Initiative to Combat Nuclear Terrorism – member

Bilateral agreements

1. Agreement between the Popular Republic of Romania and the Union of the Socialist Soviet Republics regarding the further development of cooperation on peaceful uses of nuclear energy – Bucharest, 19 April 1962	In force:	1962
2. Agreement between the Government of Socialist Republic of Romania and the Government of India in the field of peaceful use of atomic energy – Bucharest, 30 August 1971	In force:	13 November 1971
3. Agreement between Government of Socialist Republic of Romania and Government of the Kingdom of Belgium on cooperation in the peaceful uses of nuclear energy – Bucharest, 29 January 1974	In force:	16 April 1974
4. Agreement between the Government of Socialist Republic of Romania and Government of the United Kingdom of Great Britain and Northern Ireland on cooperation in the field of peaceful use of atomic energy – Bucharest, 18 September 1975	In force:	30 December 1975
5. Agreement between the Government of the Socialist Republic of Romania and the Government of Canada for co-operation in the development and application of atomic energy for peaceful purposes	In force:	1977
6. Agreement between Governments of Romania and Argentina for co-operation in the peaceful uses of nuclear energy	In force:	27 November 1990
7. Convention on Environmental Impact Assessment in a Transboundary Context – Espoo, 25 February 1991	In force:	22 February 2001
8. Agreement between Governments of Romania and the Hellenic Republic on early notification of a nuclear accident and information exchange on nuclear facilities – Athens, 10 March 1995	In force:	23 March 1995
9. Protocol of understanding on co-operation in the nuclear safety domain between CNCAN of Romania and the Institute for Nuclear Safety of Republic of Korea (KINS) – Bucharest, 21 September 1996	In force:	11 November 1996
10. Agreement between Governments of Romania and Hungarian Republic on early notification of nuclear accidents – Bucharest, 26 May 1997	In force:	3 October 1997
11. Agreement between CNCAN of Romania and Greek Commission for Atomic Energy on early notification of a nuclear accident and on information exchange about nuclear facilities – Bucharest, 22 December 1997	In force:	25 May 1998
12. Agreement between Governments of Romania and Bulgarian Republic on early notification of a nuclear accident and information exchange on nuclear facilities – Kozlodui, 28 May 1997	In force:	25 November 1997
13. Protocol of understanding on co-operation in the nuclear safety domain between CNCAN of Romania and Atomic Energy Control Board(AECB) of Canada – Ottawa, 23 June 1997	In force:	25 May 1998
14. Protocol on co-operation and information exchange in the nuclear safety domain between CNCAN and Hungarian Authority for Atomic Energy – Budapest, 12 June 1997	In force:	25 May 1998
15. Agreement between Governments of Romania and USA on peaceful applications of nuclear energy – Washington D.C., 15 July 1998	In force:	25 June 1999
16. Agreement of co-operation and information exchange in the nuclear safety domain between CNCAN of Romania and the Society for Nuclear Safety of Facilities and Reactors of Germany – Berlin	In force:	23 February 1999

17. Agreement between Governments of Romania and the United States on cooperation in counteracting the proliferation of weapons of mass destruction and to promote military relations and defense – Washington D.C., 30 March 1998	In force:	26 January 1999
18. Memorandum of Understanding for co-operation between CNCAN of Romania and the National Atomic Energy Commission (CNEA) of Argentina	In force:	8 May 2000
19. Administrative Understanding between Canadian Nuclear Safety Commission and CNCAN implementing the Agreement for Co-operation in the Development and Application of Atomic Energy for Peaceful Purposes	In force:	29 May 2000
20. Agreement between Governments of Romania and the Slovakian Republic on early notification of a nuclear accident and information exchange on nuclear facilities – Bucharest, 19 February 2002	In force:	14 May 2002
21. Agreement between Governments of Romania and the Russian Federation on Early Notification of a Nuclear Accident and Information Exchange on Nuclear Facilities – Moscow, 21 February 2002	In force:	15 May 2002
22. Cooperation Agreement between the Romanian Government and the European Organization for Nuclear Research (CERN) on the further development of scientific and technical cooperation in the research projects of CERN – Geneva, 25 March 2002	In force:	14 November 2002
23. Memorandum of Understanding for cooperation in nuclear energy project between the Ministry of Economy and Commerce from Romania and the Ministry of Commerce, Industry and Energy from the Republic of Korea – Seul, 21 July 2003	In force:	1 October 2003
24. Agreement between the Government of Romania and the Government of Republic of Korea for cooperation in order to use peaceful nuclear energy in industry, research and development – Bucharest, 3 February 2004	In force:	25 May 2004
25. Agreement between the Romanian Government and the Cabinet of Ministers of Ukraine on Early Notification of Nuclear Accidents and Exchanging of Information on nuclear and radiological safety – Vienna, 22 September 2004	In force:	29 December 2004
26. Agreement between the Nuclear Agency of Romania and the National Commission for Nuclear Activities Control from Romania and the Department of Energy from the United States of America on cooperation in combating the proliferation of nuclear weapons and technology – New York, 19 July 2004	In force:	1 March 2005
27. Agreement between the parties to the North Atlantic Treaty for cooperation regarding atomic information field – 14 February 2006	In force:	12 January 2007
28. Agreement between the Kingdom of Belgium, Kingdom of Denmark, Germany, Ireland, Italian Republic, Grand Duchy of Luxembourg, the Kingdom of the Netherlands, the European Atomic Energy Community and the International Atomic Energy Agency, on the application of Article III. 1 and Paragraph 4 of the Treaty on nuclear non-proliferation (78/164/EURATOM) – Bruxelles, 5 April 1973	In force:	11 July 2007
29. Agreement between the Government of Romania and the Government of Republic of Turkey on Early Notification of a Nuclear Accident – Bucharest, 3 March 2008	In force:	12 September 2008
30. Agreement between the Ministry of Interior and Administrative Reform from Romania and the Department of Energy from the United States of America on Cooperation in Preventing Illicit Trafficking with Nuclear Substances and Radioactive Materials – Bucharest, 15 September 2008		25 September 2008
31. Agreement between Governments of Romania and Russian Federation on cooperation for the transfer of spent nuclear fuel from a research reactor to Russian Federartion – Bucharest, 19 February 2009	In force:	15 June 2009

APPENDIX 2: MAIN ORGANIZATIONS, INSTITUTIONS AND COMPANIES INVOLVED IN NUCLEAR POWER RELATED ACTIVITIES

A. Romanian Academies

1.	Romanian Academy	
	address	125, Calea Victoriei St., 1-st District, Bucharest RO-010071 ROMANIA
	telephone number	+ 40 21 212 86 40
	facsimile number	+ 40 21 211 66 08
	e-mail address	
	web site address	www.academiaromana.ro
	president	academician Ionel HAIDUC
2.	Academy of Technical Sciences	
	address	sector 1, Cod 000000, Bucuresti, ROMANIA
	telephone number	+ 40 722 215 100
	facsimile number	
	e-mail address	dumion@astr.ro
	web site address	www.astr.ro
	president	academician Gheorghe BUZDUGAN
3.	Academy of Agricultural and Forestry Sciences "Gheorghe Ionescu-Sisesti"	
	address	61 B-dul. Marasti, 1-st District, Bucharest, RO- 011464, ROMANIA
	telephone number	+ 40 21 318 44 50
	facsimile number	+ 40 21 318 44 51
	e-mail address	asas@asas.ro
	web site address	www.asas.ro
	president	academician Cristian HERA

B. Ministries

1.	Ministry of Economy, Trade and Business Environment	
	address	152, Calea Victoriei St., 1-st District, Bucharest RO-010096 ROMANIA
	telephone number	+ 40 21 202 53 99, + 40 21 202 51 53
	facsimile number	+ 40 21 202 51 08
	e-mail address	birou_presa@minind.ro
	web site address	www.minind.ro
2.	Ministry of Education, Research, Youth and Sports	
	address	28-30, General Berthelot St, 1-st District, Bucharest RO-010168, ROMANIA
	telephone number	+ 40 21 405 62 00, + 40 21 405 63 00
	facsimile number	+ 40 21 405 62 00
	e-mail address	

	web site address	www.edu.ro
3.	Ministry of Environment and Forests	
	address telephone number facsimile number e-mail address web site address	12, Libertarii Blvd., 5-st District, Bucharest, ROMANIA + 40 21 316 02 15, + 40 21 316 61 38 + 40 21 316 61 38 birou.presa@mmediu.ro www.mmediu.ro
4.	Ministry of Foreign Affairs	
	address telephone number facsimile number e-mail address web site address	31, Aleea Alexandru St., 1-st District, Bucharest RO-011822, ROMANIA + 40 21 319 21 08, + 40 21 319 21 25 + 40 21 319 68 62 mae@mae.ro www.mae.ro
5.	Ministry of Justice	
	address telephone number facsimile number e-mail address web site address	17 Apolodor St., sector 5**,** Bucharest, RO-010366, ROMANIA + 40 372 04 10 46 + 40 372 04 10 46 relatiipublice@just.ro www.just.ro
6.	Ministry of National Defence	
	address telephone number facsimile number e-mail address web site address	3-5 Izvor St, 5 District, RO- 050561 Bucharest, ROMANIA + 40 21 402 34 00 + 40 21 319 56 98 drp@mapn.ro www.mapn.ro
7.	Ministry of Administration and the Interior	
	address telephone number facsimile number e-mail address web site address	Piata Revolutiei nr. 1A, 1-st District, Bucharest, ROMANIA + 40 21 307 25 00, + 40 21 307 26 00 + 40 21 307 25 00 petitii@mai.gov.ro www.mira.gov.ro
8.	General Inspectorate for Emergency Situations	
	address telephone number facsimile number e-mail address web site address	46 Banu Dumitrache St., 2-st District, Bucharest, ROMANIA + 40 21 208 61 50 + 40 21 242 09 90 office@igsu.ro www.igsu.ro, www.mira.gov.ro

9.	Ministry of Public Finance	
	address telephone number facsimile number e-mail address web site address	17, Apolodor St., 5-st District, Bucharest, RO-050741, ROMANIA + 40 21 319 97 59 + 40 21 312 25 09 presamfp@mfinante.ro www.mfinante.ro
10.	Ministry of Public Health	
	address telephone number facsimile number e-mail address web site address	1-3, Cristian Popisteanu St., 1-st District, Bucharest RO-010024, ROMANIA + 40 21 307 25 00, + 40 21 307 26 00 + 40 21 307 25 00 www.ms.ro
11.	Institute for Public Health Bucharest	
	address telephone number facsimile number e-mail address web site address	1-3 Dr. Leonte St., 5 District, RO-050463 Bucharest ROMANIA + 40 21 318 36 20 + 40 21 312 34 26 www.ispb.ro

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C. National Nuclear Authorities

1.	Nuclear Agency and for Radioactive Waste – AN&DR	
	address telephone number fax e-mail address web site address	21-25, Mendeleev St., 1-st District, Bucharest RO-010362, ROMANIA + 40 21 316 80 01, + 40 21 316 80 02, + 40 21 316 80 03 + 40 21 312 14 10 contact@nuclearagency.ro www.agentianucleara.ro, www.nuclearagency.ro
2.	National Commission for Nuclear Activities Control – CNCAN	
	address telephone number facsimile number e-mail address web site address	14, Libertarii Blvd., 5-st District, Bucharest, ROMANIA + 40 21 316 05 72, + 40 21 317 38 15 + 40 21 317 38 87 office@cncan.ro, relatiipublice@cncan.ro www.cncan.ro
3.	National Authority for Scientific Research – ANCS	

	address	21-25, Mendeleev St., 1-st District, Bucharest RO-010362 ROMANIA
	telephone number	+ 40 21 319 23 26, + 40 21 319 23 27
	facsimile number	+ 40 21 312 66 17
	e-mail address	media@mct.ro
	web site address	www.mct.ro
4.	Romanian Energy Regulatory Authority – ANRE	
	address	Str. Constantin Nacu nr. 3, Bucuresti, Sector 2, Cod postal 020995, ROMANIA
	telephone number	+ 40 21 311 22 44
	facsimile number	+ 40 21 312 43 65
	e-mail address	anre@anre.ro
	web site address	www.anre.ro

D. National Nuclear Companies

National Uranium Company CNU	address		68, Dionisie Lupu St.,1-st District, Bucharest RO-010458, ROMANIA
	telephone number		+ 40 21 318 52 58
	facsimile number		+ 40 21 312 91 46
	e-mail address		bucuresti@cnu.ro
	web site address		www.cnu.ro
Uranium ore extraction	Suceava Branch Crucea – Botusana Mines	address	1 Minei St., Crucea, Suceava County, ROMANIA
		telephone number	+ 40 230 57 56 30, + 40 230 57 57 31
		facsimile number	+ 40 230 57 56 30, + 40 230 57 57 31
		e-mail address	crucea@cnu.ro
		web site address	www.cnu.ro,http://www.cnu.ro/feldioara.html
UO_2 powder production	Feldioara Branch	address	1 Dumbravii St., Feldioara, Brasov County, ROMANIA
		telephone number	+ 40 268 26 51 37, + 40 268 26 54 45
		facsimile number	+ 40 268 26 51 37, + 40 268 26 54 45
		e-mail address	brasov@cnu.ro
		web site address	www.cnu.ro,http://www.cnu.ro/feldioara.html
Romanian Authority for Nuclear Activities	address		1 Nicolae Iorga St., Drobeta Turnu Severin RO-220236, ROMANIA
	telephone number		+ 40 252 32 38 48
	facsimile number		+ 40 252 32 36 85
	e-mail address		office@raan.ro

– RAAN	web site address	www.raan.ro	
Heavy Water Production	ROMAG-PROD Heavy Water Plant	address telephone number facsimile number e-mail address web site address	Calea Tg-Jiului, Km.7, Dr.Tr.Severin, Mehedinti, ROMANIA +40 252 31 12 50 +40 252 31 79 08 apagrea@romag.ro www.romag.ro
Societatea Nationala NUCLEARELECTRICA S.A Headquarters			
Nuclear Fuel Production	Nuclear Fuel Plant FCN - Pitesti	address telephone number facsimile number e-mail address web site address	1 Campului St., Mioveni, Arges County, O.P.Mioveni, C.P.nr.1, RO-115400, ROMANIA + 40 248 20 77 00 + 40 248 26 24 99 www.fcn.ro
Nuclear Electricity Producer	**Cernavoda Nuclear Power Plant**	address telephone number facsimile number e-mail address web site address	2, Medgidiei St, Cernavoda, CP 42, RO-905200, Cernavoda , ROMANIA + 40 241 23 93 37, + 40 241 23 93 38 + 40 241 23 92 66 office@nuclearelectrica.ro,gspirea@nuclearelectrica.ro www.cne.ro

E. Universities

1.	Transilvania University of Brasov	
	address telephone number facsimile number e-mail address web site address	39 Eroilor Blvd., Brasov, ROMANIA +40 268 14 46 34 +40 268 41 05 25 www.unibv.ro
2.	University Politehnica of Bucharest - Power Engineering Faculty	

	address	313 Splaiul Independentei St, 6-st District, Bucharest RO-060042, ROMANIA
	telephone number	+40-21-402 94 01; +40-21-402 94 62, +40-21-318 10 22
	facsimile number	+40-21-402 96 75
	e-mail address	
	web site address	www.pub.ro, www.energpub.ro
3.	University of Bucharest - Faculty of Physics	
	address	Platforma Măgurele, Str. Fizicienilor nr. 1, CP Mg - 11, Bucharest-Măgurele, RO - 76900, Buchares, ROMANIA
	telephone number	+40 21 780 47 70, +40 21 780 78 80
	facsimile number	+40 21 420 86 25
	e-mail address	rectorat@univ-ovidius.ro
	web site address	www.fizica.unibuc.ro/
4.	Technical University of Cluj Napoca	
	address	Str. Constantin Daicoviciu nr 15, 400020 Cluj - Napoca, ROMANIA
	telephone number	+40 264 40 12 00, +40 264 40 12 48
	facsimile number	+40 264 59 20 55
	e-mail address	
	web site address	www.utcluj.ro
5.	University of Craiova - Faculty of Physics	
	address	13 A. I. Cuza Street, 200585 Craiova , ROMANIA
	telephone number	+40 251 41 50 77
	facsimile number	+40 251 41 50 77
	e-mail address	fizica@central.ucv.ro
	web site address	http://cis01.central.ucv.ro/physics/physics.htm
6.	Ovidius University of Constanta	
	address	124 Mamaia Blvd., Constanta, 8700, ROMANIA
	telephone number	+40 241 61 83 72
	facsimile number	+40 241 61 83 72
	e-mail address	rectorat@univ-ovidius.ro
	web site address	www.univ-ovidius.ro/
7.	"Gheorghe Asachi" Technical University of Iasi	
	address	Bd. Dimitrie Mangeron, nr. 53A, 700050 Iaşi, ROMANIA
	telephone number	+40 232 21 23 26
	facsimile number	+40 232 21 23 26
	e-mail address	didactic@staff.tuiasi.ro
	web site address	www.tuiasi.ro
8.	“Alexandru Ioan Cuza” University of Iasi - Faculty of Physics	

	address 11, Carol I Boulevard, Iaşi RO-700506, ROMANIA telephone number +40 232 20 10 50 facsimile number +40 232 20 11 50 e-mail address admphys@uaic.ro web site address www.phys.uaic.ro
9.	University of Pitesti - Faculty of Sciences
	address 1 Târgul din Vale St., Piteşti, Argeş county, RO-110040, ROMANIA telephone number +40 248 21 88 04 facsimile number +40 248 21 64 48 e-mail address info@upit.ro web site address www.upit.ro
10.	"Lucian Blaga" University of Sibiu - Faculty of Sciences
	address 5-7, Ion Raţiu Street, Sibiu, 550012, ROMANIA telephone number +40 232 20 10 50 facsimile number +40 232 20 11 50 e-mail address stiinte@ulbsibiu.ro web site address www.ulbsibiu.ro
11.	University Politehnica of Timisoara
	address 2 Pta Victoriei St., RO-300006, Timisoara , ROMANIA telephone number +40 256 40 30 00 facsimile number +40 256 40 30 21 e-mail address rector@rectorat.upt.ro web site address www.upt.ro

F. National Institutes of Research & Development

1.	Center of Technology And Engineering for Nuclear Projects (SITON)
	address 409 Atomistilor St., Magurele, Judet Ilfov Bucharest – Magurele, ROMANIA telephone number +40 21 457 44 31 facsimile number +40 21 457 44 29 e-mail address citon@router.citon.ro web site address www.citon.ro
2.	"Horia Hulubei" National Institute of Physics and Nuclear Engineering (IFIN-HH)
	address Str. Atomistilor no.407, P.O.BOX MG-6, Bucharest – Magurele, ROMANIA telephone number +40 21 404 23 00 facsimile number +40 21 457 44 40 e-mail address dirgen@ifin.nipne.ro web site address www.nipne.ro

3.	Institute for Nuclear Research Pitesti (SCN Pitesti)	
	address	1 Campului St., POB 78, Mioveni, Arges County, RO-115400, ROMANIA
	telephone number	+ 40 248 21 34 00
	facsimile number	+ 40 248 26 24 49
	e-mail address	office@nuclear.ro
	web site address	www.nuclear.ro
4.	National Research Institute of Cryogenics and Isotopic Separations ICSI Rm.Valcea	
	address	Uzinei Street 4, PO Box 10, Post Office 4 Ramnicu Valcea RO-240050, ROMANIA
	telephone number	+40 250 73 27 44, +40 250 73 38 90
	facsimile number	+40 250 73 27 46
	e-mail address	office@icsi.ro
	web site address	www.icsi.ro
5.	National Institute for Laser, Plasma and Radiation Physics INFLPR	
	address	Str. Atomistilor no.409, P.O.BOX MG-36, Bucharest – Magurele RO-077125, ROMANIA
	telephone number	+40 21 457 44 89
	facsimile number	+40 21 457 44 89
	e-mail address	rares.medianu@inflpr.ro
	web site address	www.inflpr.ro
6.	National Institute of Materials Physics NIMP	
	address	Str. Atomistilor no.105bis, P.O.BOX MG-7, Bucharest – Magurele, RO-077125, ROMANIA
	telephone number	+40 21 369 01 85
	facsimile number	+40 21 369 01 77
	e-mail address	pintilie@infim.ro
	web site address	www.infim.ro
7.	National Institute of Research and Development for Isotopic and Molecular Technologies	
	address	65-103 Donath St., P.O.Box 700, Post Office 5 Cluj-Napoca RO-400293, ROMANIA
	telephone number	+40 264 58 40 37
	facsimile number	+40 264 42 00 42
	e-mail address	itim@itim-cj.ro
	web site address	www.itim-cj.ro
8.	National Institute of Research & Development for Technical Physics (IFT) Iasi	
	address	47 Mangeron Boulevard, Iasi, RO-700050, ROMANIA
	telephone number	+ 40 23 243 06 80
	facsimile number	+ 40 23 223 11 32
	e-mail address	
	web site address	www.phys-iasi.ro
9.	Research and National Institute for Metals and Radioactive Resources ICPMRR Bucharest	

	address	70 Carol I Blvd., Bucharest RO-020917, ROMANIA
	telephone number	+40 21 315 23 42
	facsimile number	+40 21 313 12 58
	e-mail address	icpmrr@icpmrr.ro
	web site address	www.icpmrr.ro

G. Non-Governmental Organizations

1.	Romanian Associations "Nuclear Energy"	
	address	65 Polona St., 1-st District, Bucharest, ROMANIA
	telephone number	+40-21-203 82 53
	facsimile number	+40-21-211 98 04
	e-mail address	mstiopol@nuclearelectrica.ro
	web site address	www.aren.ro
2.	ROMATOM	
	address	33 Gh Magheru Blvd., 1-st District, Bucharest, RO-010325, ROMANIA
	telephone number	+40-21-203 82 52
	facsimile number	+40-21-311 94 00
	e-mail address	mstiopol@nuclearelectrica.ro
	web site address	www.romatom.ro
3.	Romanian National Committee of World Energy Council	
	address	1-3 Lacul Tei Blvd, 2-st District, Bucharest, ROMANIA
	telephone number	+40-21-211 41 55, +40-21-211 41 56
	facsimile number	+40-21-211 41 57
	e-mail address	secretariat@cnr-cme.ro
	web site address	www.cnr-cme.ro

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