



# Lessons learned from completion of nuclear power plant EMO 3,4 Case Study

Geneva, November 24, 2010 Juraj Chren, Centrel Business Development Manager

### Slovenské Elektrárne, member of Enel group, is the leading generation company in Slovakia Production portfolio composition



### Case study – EMO 3,4 completion Project background and history

#### Restart of the project in the nuclear renaissance era

- Construction of units 3 and 4 of VVER-440 nuclear power plant in Mochovce ("EMO 3,4") were started in 1986 and suspended in 1992
- Approximately 30% of technology had been supplied and 70% of civil works had been done
- Slovenske elektrárne, a.s. ("SE") acquired by Enel in 2006 (66%), started project of EMO 3,4 completion in 2009
- SE possesses wide experience basis regarding VVER nuclear technology gained with development, construction and operation of EMO 1,2 and EBO 1,2,3,4 power plants
- EMO 3,4 will be ready for the power up-rate after the phase-in scheduled to 2012 and 2013
- EMO 3,4 represents the biggest private sector investment in Slovakia ever.



### Main project data

Investment cost
Construction period
Unit 3
Unit 4
1st synchronization
Unit 3

**Contractual strategy** 

Jacob Barris		
A subscription		
		the de

30.12.2012

2 775 M€

50 months 58 months

Contractual strategy	Multi-contract (more than 100 contracts)
Architect Engineer	Slovenske elektrarne-Enel
Main Contractors	
Nuclear Island:	Skoda JS, ASE, VUJE, Enseco, ISKE, PPA, Rolls Royce
Conventional Island:	Enel (EPCM Contractor), Skoda Power, Brush, ZIPP
Main Instrumentation and Control:	Areva-Siemens

#### **Project Management Team**

Peak number of resources

#### Site construction

Site man-hours

Peak number of workers

November 24, 2010

Enel Case Study

approx. 420 (SE + Enel EPCM, outsourcing excluded)

More than 15 million More than 3500



Steel Enel

4

Completion of EMO 3,4

### Case study – EMO 3,4 completion Legal and regulatory framework

#### Slovakia – nuclear country

- Slovakia is nuclear country with well developed regulatory framework, established and working regulatory and nuclear oversight authorities and positive perception of citizens
- EMO 3,4 is in compliance with the IAEA standards and undergone all required international and local permitting and licensing procedures including EU commission inquiry
- SE with existing nuclear production has been in positive working relationship with all nuclear authorities and regulatory bodies.
- Nuclear project development in well experienced country represents considerable simplification and strongly supported project feasibility
- Some legislation change required, however was well defined in the privatization documents.



### Case study – EMO 3,4 completion Financing

Positive financial performance of SE made the financing easier

- SE successfully passed through the restructuring and cost reduction process after acquisition by Enel that enabled flexible financing structure
- Operating cash flow is the key source of EMO 3,4 financing
- Multi-purpose loan facility, secured by corporate cash flow, supplemented required funds
- No state or mother company guarantees has been required
- Project financing, typically used for financing of energy projects based on conventional or renewable fuels in the region, was not necessary.



### **Case** study – EMO 3,4 completion SE has become a healthy company and it made financing easier

#### SE's changeover - a gradual process of continuous improvement



EBITDA and Net debt development



#### Fitch rating was continuously improved from BB+ in 2006 to the current level (2010) of BBB

7



Enel

### **Case** study – EMO 3,4 completion Positive results support new investment strategy

#### SE investment plan



Over 3 bln EUR<br/>investments in SKUp-rate of EMO 1&2 and EBO 3&4<br/>Completion of EMO 3&4<br/>Refurbishment of thermal plants<br/>Biomass and small hydro projectsFurther growthHub for commercial activities in the region<br/>Hub for expansion in region<br/>Leverage sustainable energy competences<br/>R&D activities



⁄ Enel

### **Case** study – EMO 3,4 completion Energy policy and market conditions

#### Supportive energy policy and liberalized market

- Energy policy of Slovakia strongly supported EMO 3,4 completion to assure energy independence and fuel diversification
- Decommissioning of two units of EBO V1 as a result of EU accession treaty resulted in lack of generating capacity in Slovakia
- Slovak energy market has undergone robust liberalization process (including privatization of SE and distribution companies)
- Slovakia, member of ENTSO-E, is well covered with the high-voltage grid with considerable interconnections to surrounding countries
- EU energy market integration supports export potential of SE.



### Case study – EMO 3,4 completion Investment environment

#### **Favorable investment conditions**

- Political stability, Slovakia is a member of EU, NATO and number of world trade, economic and security organizations
- Economic stability, country rating: A+ (S&P|
- Flat tax regime of 19% with 0% withholding taxes on dividends
- Currency stability Euro has been adopted in 2009
- Highly skilled and experienced workforce
- Steady developing road and railway infrastructure in the very center of the Europe
- Law enforcement improving continuously.



### Case study – EMO 3,4 completion Liabilities and risks mitigation

#### Tailored multi-contract vendor solution

- EMO 3,4, representing completion of the power plant, was a specific case where multi-contract vendors structure were adopted rather than turn-key solution
- SE employs well experienced professionals participating on similar nuclear development projects in the past
- Costs overrun and delay risks covered in vendor contracts.



### **Completion of EMO 3,4 provides positive effects**

- Energy security
- 45% of Slovak electricity consumption will be covered by completed Mochovce NPP
- Total investment of 2.775 bln. EUR
- Up to 4 500 jobs
- Neither state aid nor state guarantees

<image><section-header><section-header>

- Rebuilding of technical competencies (78% of supplies delivered by SK and CZ companies)
- Center of excellence in VVER
   technology
- Slovak nuclear R&D activities (jointly with Slovak Academy of Science, VUJE, Technical University)



12

Completion of EMO 3,4

### SK Electricity Balance 2009-2030 Long term support to energy security

#### **SLOVAK PRODUCTION MIX 2009**



#### **SLOVAK ENERGY BALANCE 2009**



**SLOVAK PRODUCTION MIX 2030** 

21%

57%

Hydro & renewables



November 24, 2010

Enel Case Study

Nuclear

22%

## Case study – EMO 3,4 completion

### **Execut**ive summary

	Lessons learned summary
Regulatory framework	<ul> <li>Experience counts: Slovakia has been a nuclear country with well developed regulatory framework, established and working regulatory and oversight authorities and positive perception of citizens</li> </ul>
Financing	<ul> <li>Healthy and well performing company: Project financing, typically used for financing of energy projects based on conventional or renewable fuels in the region, was not used.</li> </ul>
	<ul> <li>Combination of operating cash flow and uncollateralized multi-purpose loan facility was chosen to improve project flexibility and costs</li> </ul>
Energy policy and market	<ul> <li>Energy policy of Slovakia strongly supported EMO 3,4 completion to support energy independence and fuel diversification</li> </ul>
	<ul> <li>Slovak energy market have undergone robust liberalization process</li> </ul>
	<ul> <li>Slovakia, member of ENTSO-E, is well covered with the high-voltage grid with considerable interconnections to surrounding countries</li> </ul>
Investment environment	<ul> <li>Slovakia represents a stable country with favorable tax regime, experienced workforce, steady developing infrastructure and law enforcement</li> </ul>
Liabilities and risks mitigation	<ul> <li>EMO 3,4 is being completed using multi-contract strategy with the key technology providers as supplier of both nuclear and conventional island.</li> <li>SLOVENSKÉ ELEKTRÁRNE</li> </ul>

