



Power System of Ukraine

28/03/2012

**Electricity Stakeholder Event on Transit and Cross-Border Cooperation
Energy Charter Secretariat
Brussels, Belgium**

Ukraine



Population – about 46 mln. people
The capital – Kyiv

Neighboring countries:

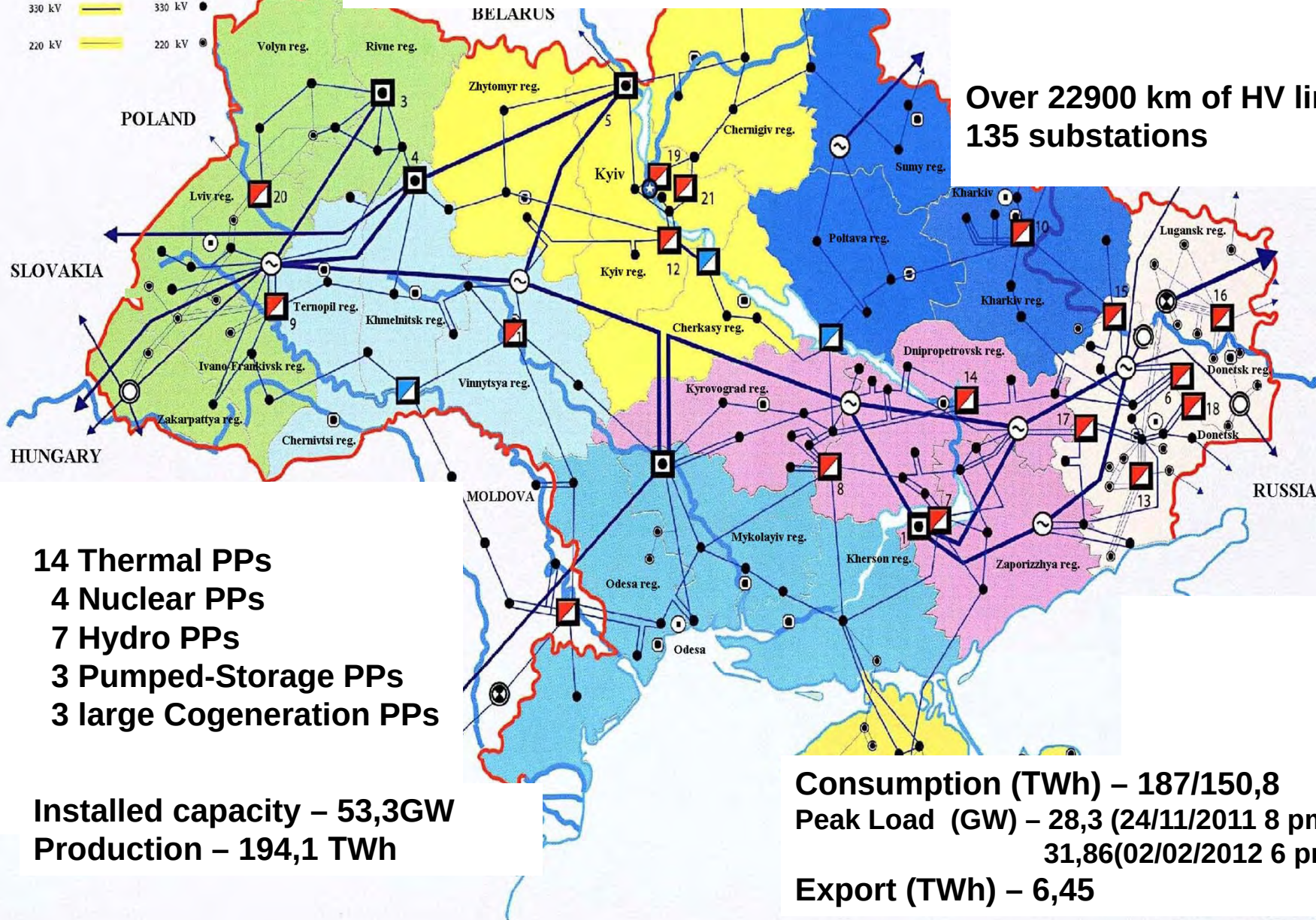
Belarus, Hungary, Moldova,
Poland, Romania, Russia and
Slovakia

Total area - 603,700 sq. km
length of the borders – 7,590 km

Total

Interconnected Power System of Ukraine

Overhead lines	Substations	Power plants
800 kV	800 kV	NPP
750 kV	750 kV	TPP
400-500 kV	400-500 kV	HPP
330 kV	330 kV	
220 kV	220 kV	



Over 22900 km of HV lines
135 substations

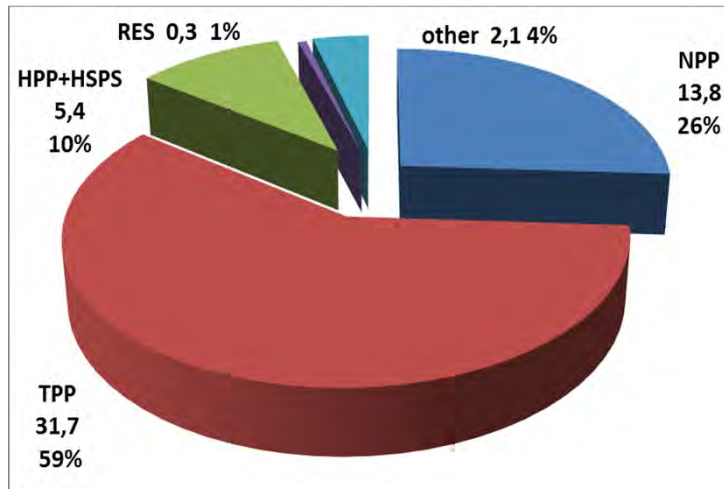
14 Thermal PPs
4 Nuclear PPs
7 Hydro PPs
3 Pumped-Storage PPs
3 large Cogeneration PPs

Installed capacity – 53,3GW
Production – 194,1 TWh

Consumption (TWh) – 187/150,8
Peak Load (GW) – 28,3 (24/11/2011 8 pm)
31,86(02/02/2012 6 pm)
Export (TWh) – 6,45

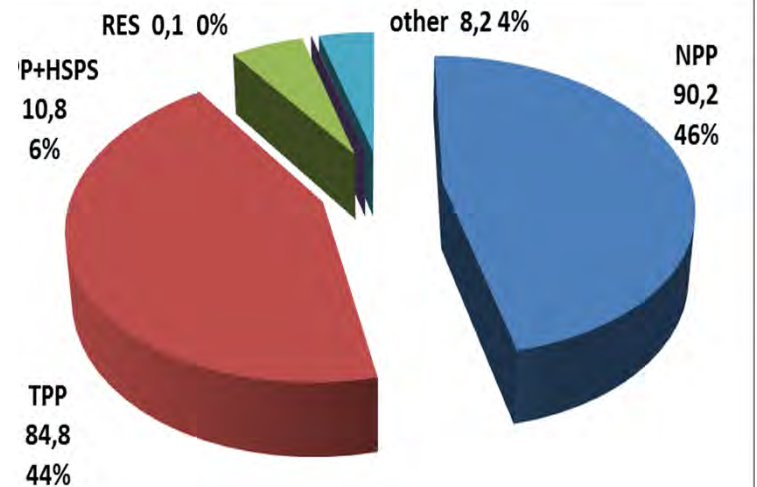
Generation

Installed capacity – 53,3GW



PPs:
14 Thermal
102 units: 800-150MW
4 Nuclear:
15 units: 1000-440MW
7 Hydro:
94 units: 117-19MW
3 Pumped-Storage:
9 units: 325-37MW
3 large Cogeneration:
9 units: 250–100MW

Production – 194,1 TWh



Substations – 135

Capacity of Transformers - 78192 MVA

800	1	
750	8	16613
500	2	1753
400	2	1609
330	88	48616
220-110	35	9600

4762 Circuit breakers of 6-750 kV

Transmission Network

Length of UH+HVL: 22256 km



800	99
750	4121
500	375
400	339
330	13346
220	3976
110-35	667

Import / Export Capability of Ukrainian IPS



Country	Interstate Lines (220-750kV)
Russia	14
Moldova	7
Belarus	2
Poland	2
Slovakia	2
Hungary	4
Romania	2
	33

Schedule export on 2012 to:

ENTSO-E (SL,HU,RO) – 545 MW

(PL) – 235 MW

Moldova – 700 MW

Russia – 0

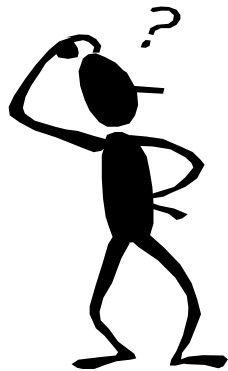
Belarus – 800 MW

Mode of operation with neighboring countries:

- most of Ukrainian IPS – synchronously with UPS of Russia / IPS of Belarus / PS of Moldova
- south-western part of Ukrainian IPS - synchronously with ENTSO-E

Goals and objectives of Ukrainian IPS

- Satisfy the consumers' demand for electricity and power
- Ensure generation and transmission of installed capacity of power plants
- Transmit electricity between the parts of IPS and enhance security of supply to all regions of Ukraine
- Provide reliable power supply for native consumers from generators of IPS of Ukraine



Quality and operational reliability of power system – in meeting the criteria of safety, security and stability of work

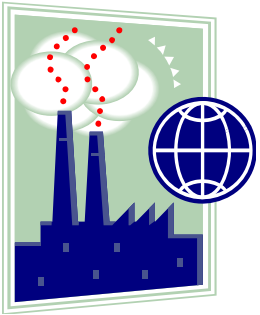


A map of Ukraine with various regions labeled in Russian. The city of Odessa is marked with a red star and labeled 'ОДЕСА' in the southwest. The Black Sea is visible to the south. Major cities like Kyiv, Lviv, and Kharkiv are also labeled. The map shows a network of roads and railways connecting different parts of the country.

**2013 – 2015: EUR 2,5 bln., including
EUR 935 mln. – from IFO (IBRD,
EBRD, EIB and KfW)**

190 km of 750 kV line construction between Zaporizhia NPP and 750 kV Kakhovka SS (2x1000 MVA) – for power transmission from Zaporizhia NPP (Eur 500 mln)

Upgrading of IPS of Ukraine



- upgrading and rehabilitation of existing generation equipments for TPPs and HPPs (control systems), as well as backbone network entities, under obligatory performance of modern technical requirements
- creation of up-to-date telecommunication system
- development of automatic frequency and power control system, as also switching devices remote control
- connection of energy control center of IPS of Ukraine to the data transmission system Electronic Highway and to the coordination centre of European system operators

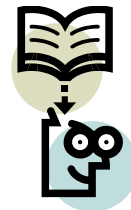


Implementation of power market, market of system services and balancing market

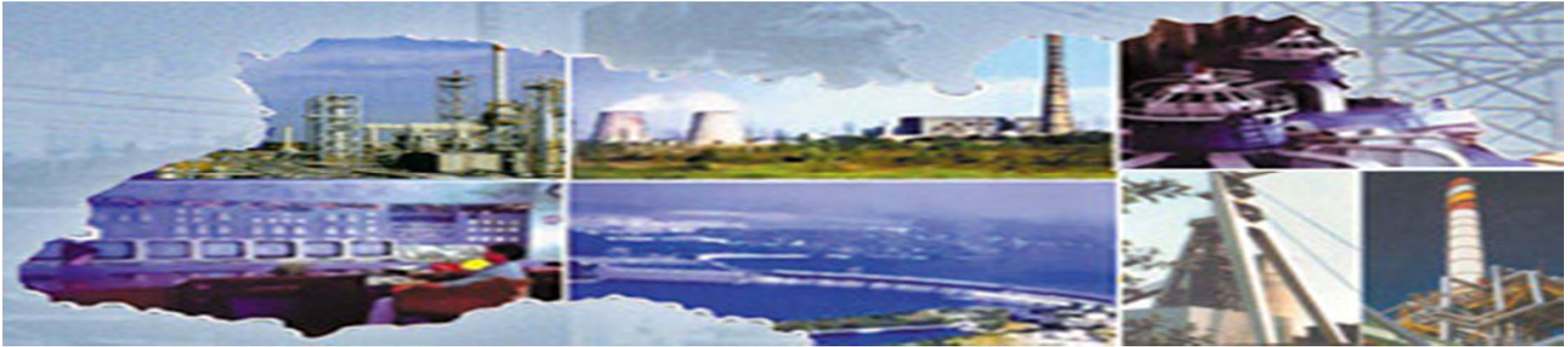
Legislation for power industry sector



- Adapt Ukrainian power industry legislation to international rules and standards, revise the regulatory basis and create normative-technical framework with proper approval of technical requirements for power industry objects
- Adapt technical regulations, rules and requirements that are acting in Ukraine, to the provisions of Operation Handbook by ENTSO-E
- Apply principles, stated in Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 and in the Regulation (EC) № 1228/2003 of the European Parliament and of the Council of 26 June 2003



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Thank you for attention!

Sergii Kornius, UKRENERGO

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