



# Energy Sector of Ukraine

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# Map of Ukraine

*Area 603,628 sq km*

*Population 45.2 million*



# Politics of Ukraine

***Presidential Democratic Republic***

***Multi-party system***

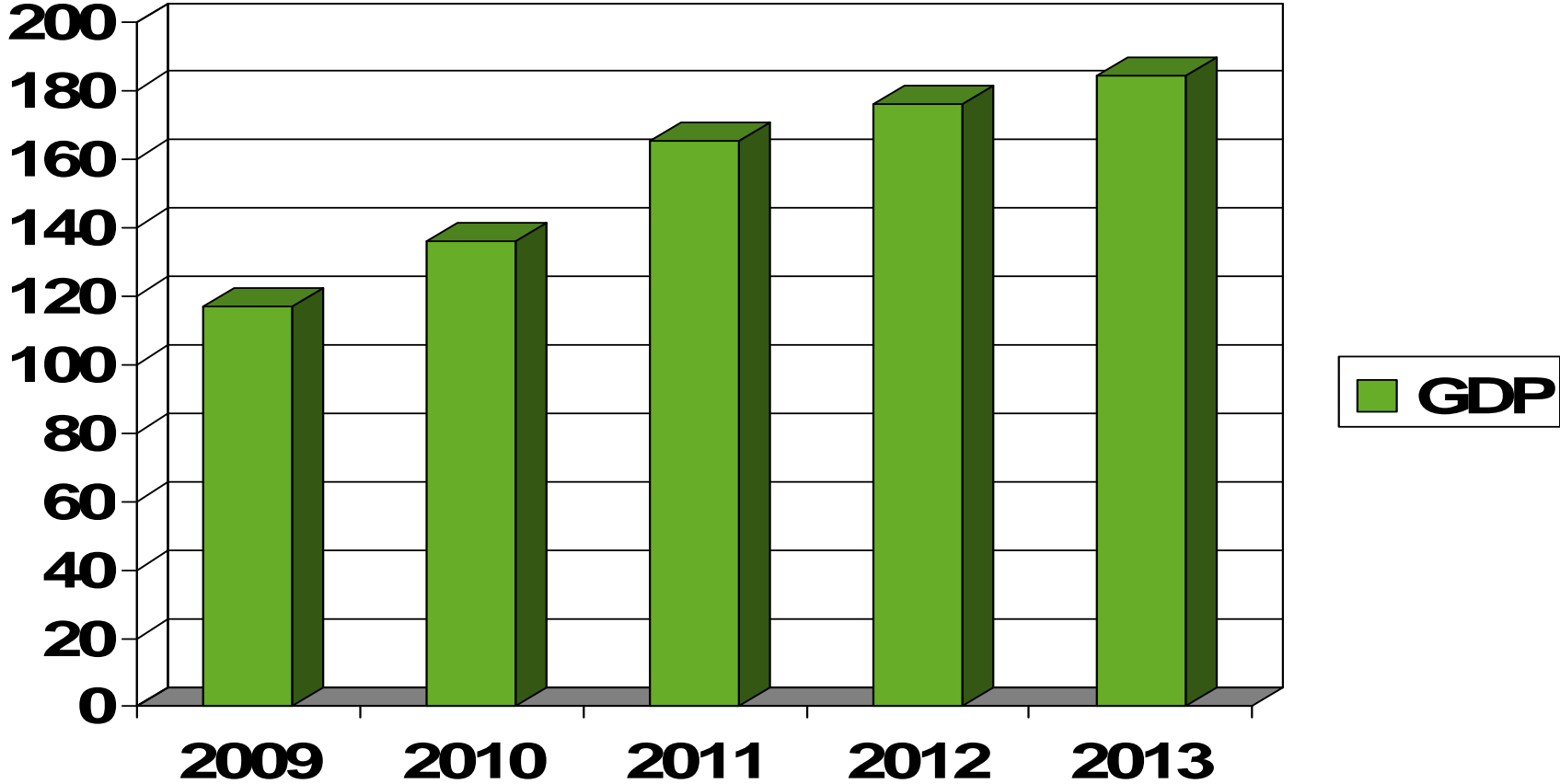
***Executive power – Cabinet of Ministers***

***Legislative power - Verkhovna Rada***

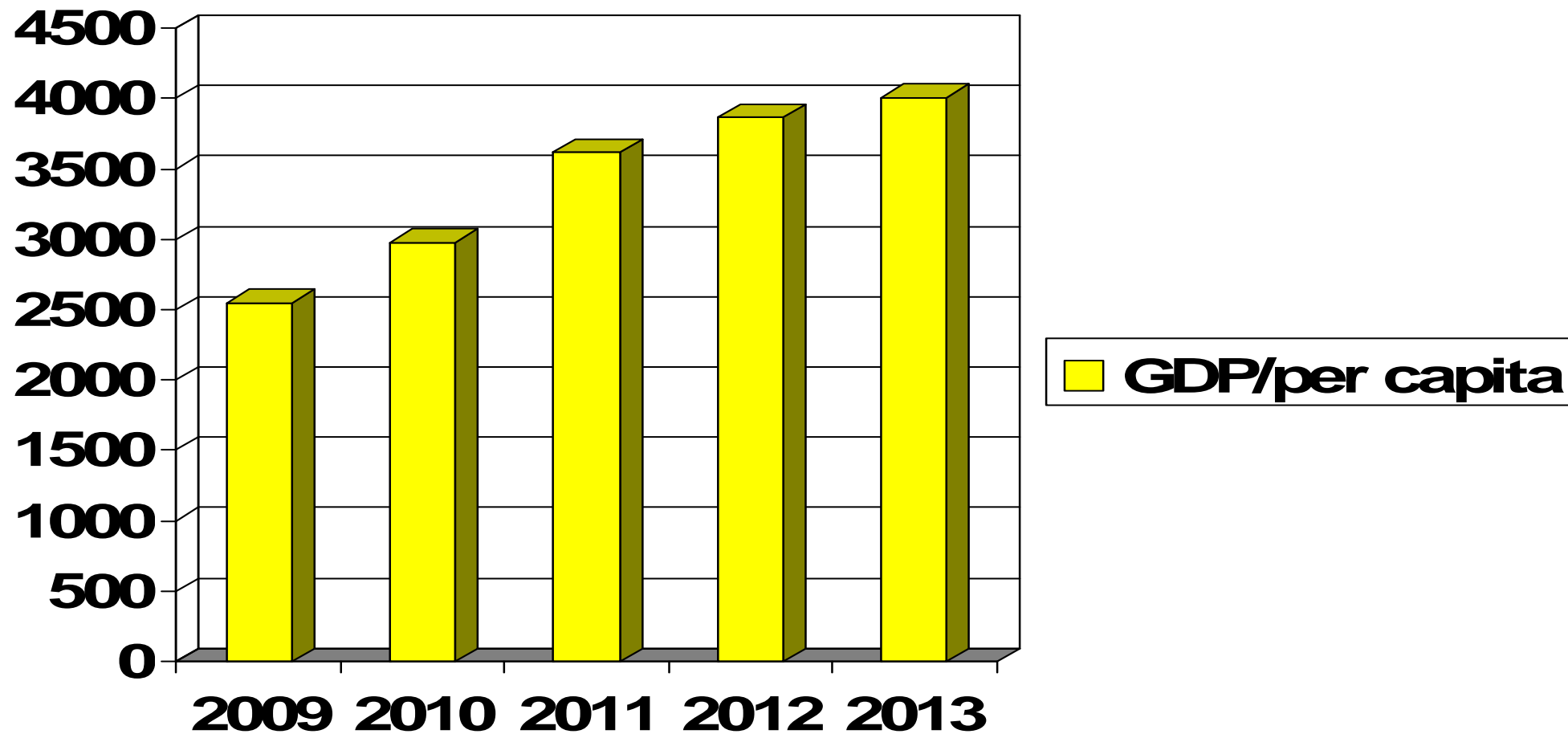
The country is administered through a structure of 24 oblasts, The Crimea Autonomous Republic and two municipalities with oblast status, Sevastopol and Kyiv.

***Currently, the Crimean Peninsula is controlled by the Russian Federation, its status is not recognized by the United Nations.***

# Gross Domestic Product indicators 2009-2013, bln USD



## Gross Domestic Product per capita 2009-2013, USD



# Energy Policy of Ukraine

## 1. Programme of Economic Reforms for 2010-2014

- an economically viable level tariffs for households;
- privatisation of power supply and thermal power generation;
- new wholesale electricity market model up and running;
- specific energy efficiency of the economy improved by at least 20%.

## 2. Updated Energy Strategy of Ukraine for a period till 2030

- to develop effective regulatory framework;
- to increase of domestic energy resources;
- to drive energy efficiency;
- cost reflective pricing;
- to improve conditions for private investment.

## **Energy Community Treaty 2011**

*Extends the EU internal market to South East Europe*

*The common legal framework*

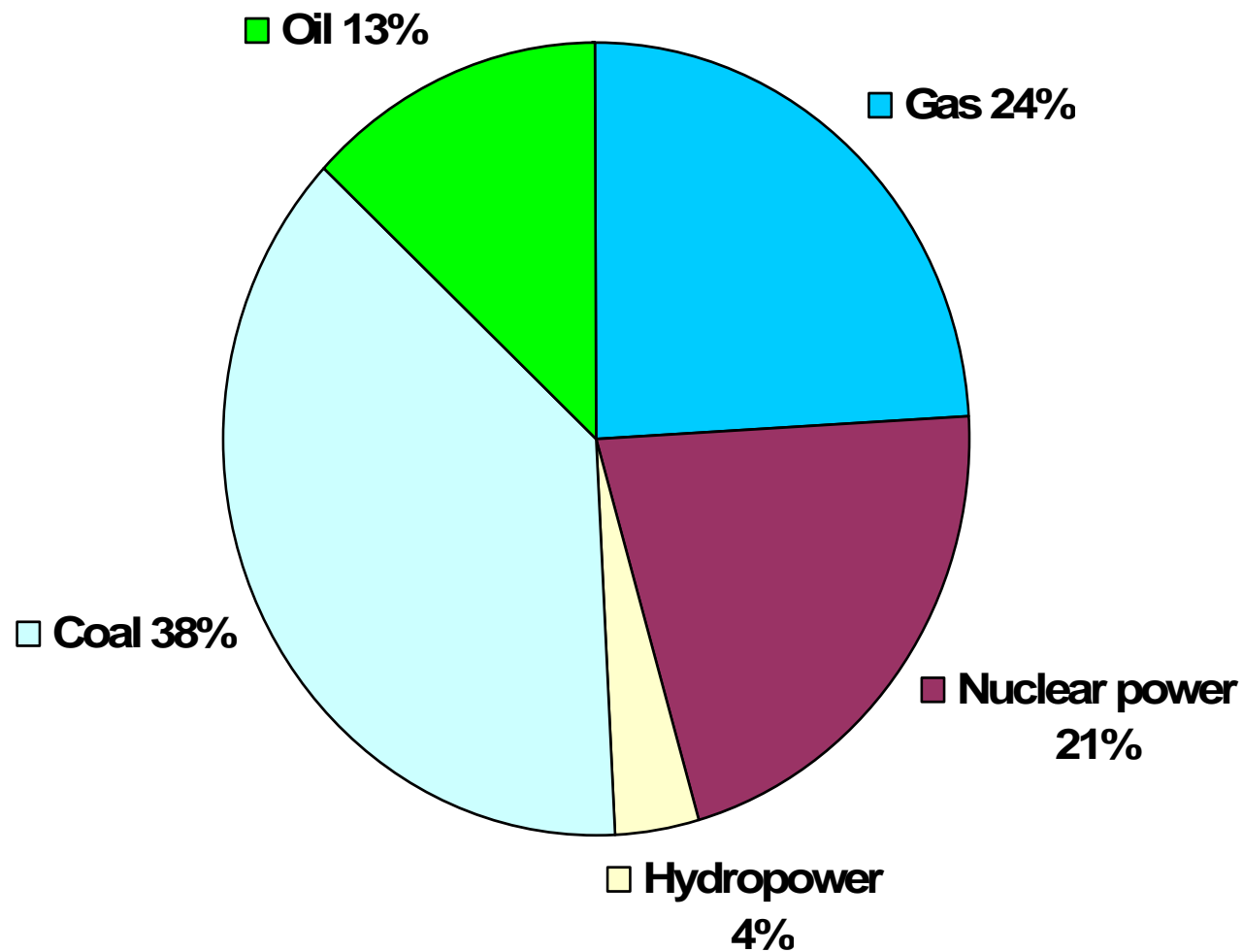
- ▶ **Gas** (Third package) (3 Directives, 2 Regulations)
- ▶ **Electricity** (Third package) (2 Directives, 3 Regulations)
- ▶ **Environment** (3 Directives)
- ▶ **Competition** (some provisions of the Treaty)
- ▶ **Renewable energy sources** (RES Directive)
- ▶ **Energy efficiency** (7 Directives, 5 Regulations)
- ▶ **Antitrust and state aid** (some provisions of the Treaty)
- ▶ **Statistics** (1 Directive, 1 Regulation)
- ▶ **Oil** (1 Directive)

# Energy Policy Responsibilities Institutions

- ▶ **Ministry of Energy and Coal Industry**
- ▶ **Ministry of Ecology and Natural Resources**
- ▶ **Ministry of Finance**
- ▶ **Ministry of Economy and Trade Development**
- ▶ **Ministry of Regional Development, Construction and Housing**
- ▶ **National Commission for State Energy Regulation**
- ▶ **Antimonopoly Committee**
- ▶ **State Nuclear Regulatory Inspectorate**



## Structure of Ukraine's primary resources, as of 2013



## Natural Gas

*Capacity Ukraine's Gas Transport System  
39,800 km of pipelines*

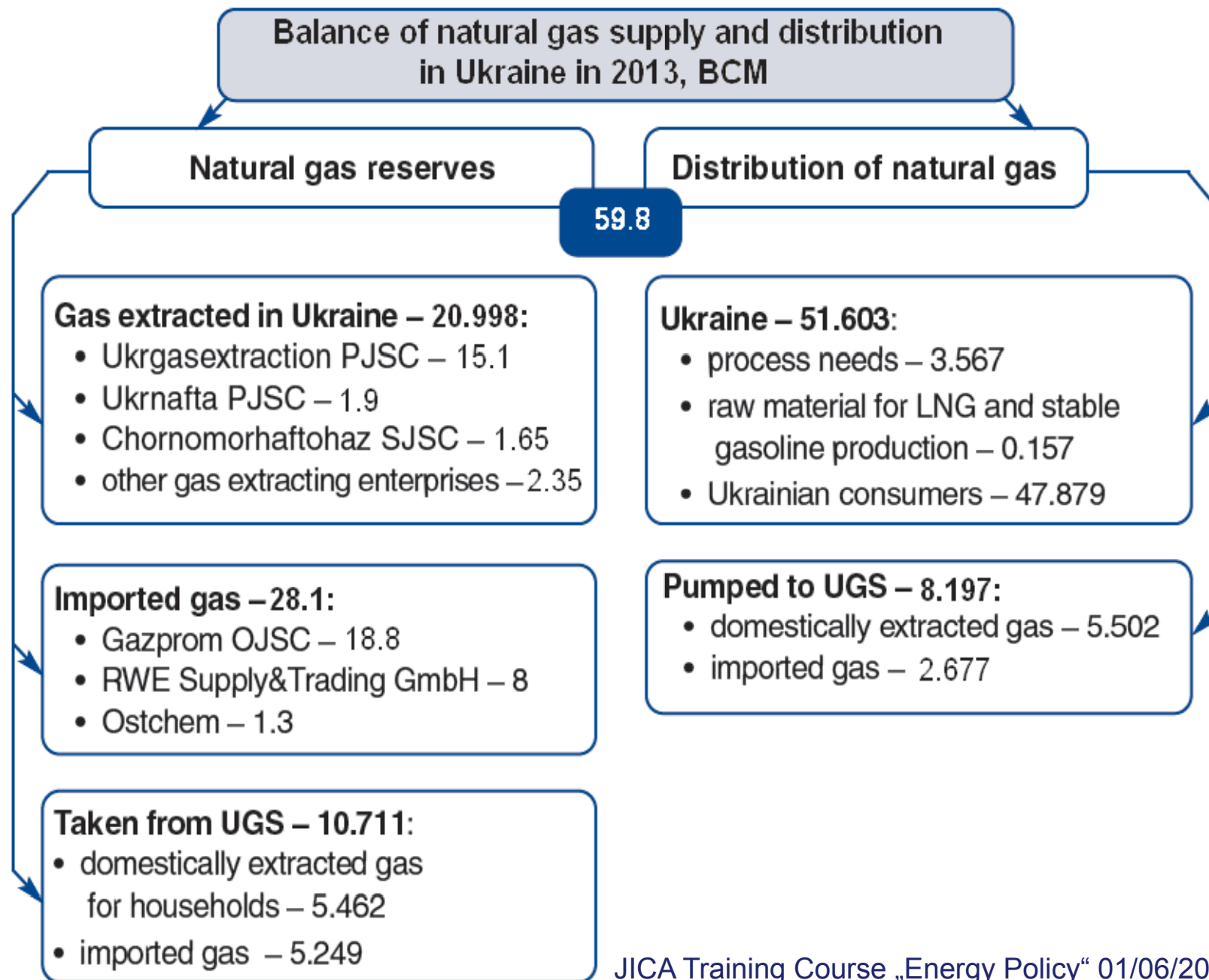
*13 underground storage sites (total volume 32 bcm)*

*75 compressor stations (175 bcm potential capacity)*

## Demand

*118.1 bcm in 1991 to 54.9 bcm in 2012*





# Oil



***Ukraine is a net importer of crude oil and refined oil products.***

***Domestic oil has been declining since the peak of 4.5 mt in 2006 to 3.3 mt in 2012***

***Total oil product demand averages 14.4 mt.***

***In 2013, total oil product demand was 14.2 mt. Ukraine produced 3.1 mt oil. (21,8% of the needs).***

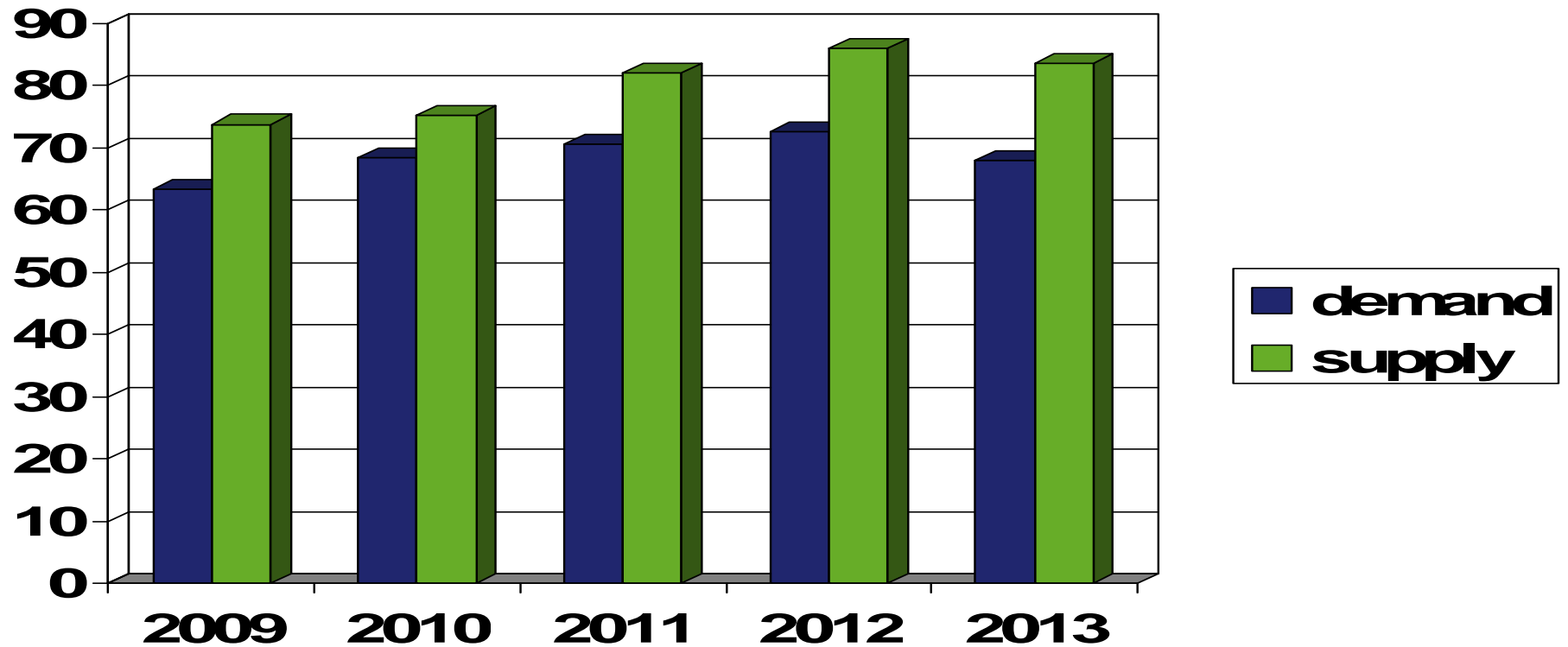
***All domestic oil sold at auction and processed at refineries Ukraine.***

***2009 Government Resolution envisages the creation of emergency oil and petroleum products stocks by 2020. A new draft law is under preparation.***

# Coal

7th largest coal reserves in the world – 34 billion tones

3rd largest anthracite coal reserves – 5.8 billion tones

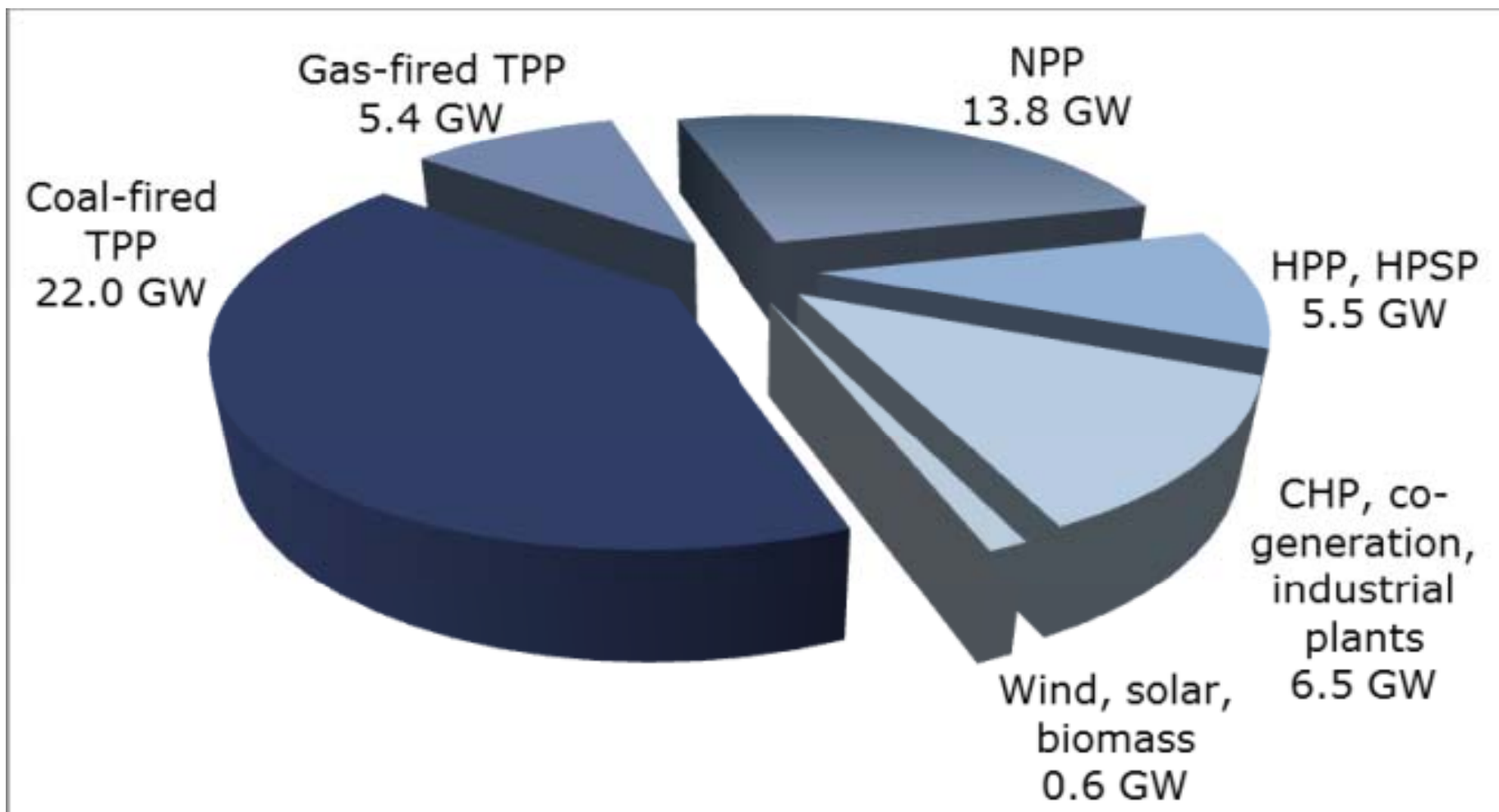


# Electricity



- The United Energy System of Ukraine is one of the largest in Europe with power plants' total installed capacity of about 53.8 GW
- The UES is operating synchronously with the energy systems of Russia, Belarus, Moldova, other CIS countries and certain Baltic States.
- The UES is dominated by large TPPs, NPPs and HPPs accounting in total for 87% of installed capacity and about 90% of generation output.
- Thermal and nuclear power plants hold dominant position in electricity generation.
- Shares of other power generating facilities are relatively small.
- Final consumption of electricity fell significantly in the 1990s from about 200 terawatt-hours (twh) in 1991 to 107 twh in 2001 due to reduced economic activity in most sectors, especially in industry.

# Electricity



*Installed Capacity of Ukrainian Power Plants (December 2013)*

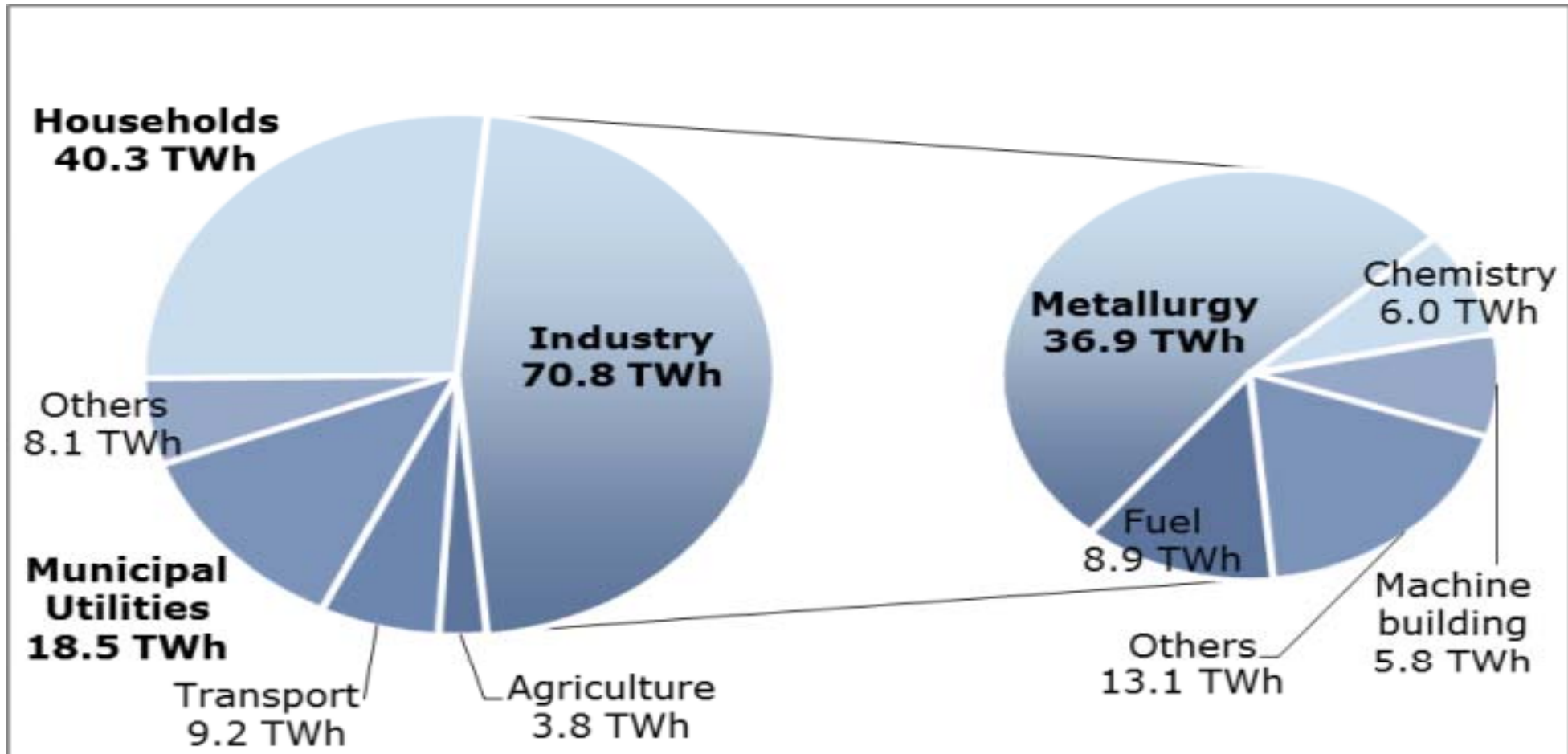
# Electricity

Power Generating Facilities/Technology	Gross Installed Capacity		Gross Electricity Generation	
	<i>GW</i>	<i>% of total</i>	<i>bln kWh</i>	<i>% of total</i>
<i>TPP</i>	<i>27.4</i>	<i>51%</i>	<i>86.6</i>	<i>44.7%</i>
<i>NPP</i>	<i>13.8</i>	<i>26%</i>	<i>83.2</i>	<i>43.0%</i>
<i>HPP/HPSP</i>	<i>5.5</i>	<i>10%</i>	<i>14.3</i>	<i>7.4%</i>
<i>CHP, other co-generation</i>	<i>6.5</i>	<i>12%</i>	<i>8.3</i>	<i>4.3%</i>
<i>Wind, solar, biomass</i>	<i>0.6</i>	<i>1.1%</i>	<i>1.2</i>	<i>0.60%</i>
<i>Total</i>	<i>53.8</i>	<i>100%</i>	<i>193.5</i>	<i>100%</i>

Ukraine's Electricity Generation Mix in 2013



# Electricity



Ukraine's Electricity Consumption in 2013

# Nuclear energy

Unit	Current status	Model	Net capacity (MW)	Gross capacity (MW)	Start of construction	Grid connection (licence until)
Khmelnitski-1	Operational	VVER-1 000	950	1 000	1981	1987 (2017)
Khmelnitski-2	Operational	VVER-1 000	950	1 000	1985	2004 (2034)
Rivne-1	Operational	VVER-440	381	420	1973	1980 (2010)*
Rivne-2	Operational	VVER-440	376	415	1973	1981 (2011)*
Rivne-3	Operational	VVER-1 000	950	1 000	1980	1986 (2016)
Rivne-4	Operational	VVER-1 000	950	1 000	1986	2004 (2034)
South Ukraine-1	Operational	VVER-1 000	950	1 000	1977	1982 (2012)
South Ukraine-2	Operational	VVER-1 000	950	1 000	1979	1985 (2015)
South Ukraine-3	Operational	VVER-1 000	950	1 000	1985	1989 (2019)
Zaporizhia-1	Operational	VVER-1 000	950	1 000	1980	1984 (2014)
Zaporizhia-2	Operational	VVER-1 000	950	1 000	1981	1985 (2015)
Zaporizhia-3	Operational	VVER-1 000	950	1 000	1982	1986 (2016)
Zaporizhia-4	Operational	VVER-1 000	950	1 000	1983	1987 (2017)
Zaporizhia-5	Operational	VVER-1 000	950	1 000	1985	1989 (2019)
Zaporizhia-6	Operational	VVER-1 000	950	1 000	1986	1995 (2025)
Capacity in operation			13 107	13 835		
Khmelnitski-3	Under construction	VVER-1 000	950	1 000	1986	2018 (planned)
Khmelnitski-4	Under construction	VVER-1 000	950	1 000	1987	2020 (planned)
Capacity under construction			1 900	2 000		

# Renewable energy



Renewable Energy source	Number of generating facilities	Installed capacity (MW)		Electricity generation (million kWh/year)
		Total	Introduced in 2013	
<b>Wind</b>	<b>11</b>	<b>146.42</b>	<b>69.84</b>	<b>88.98</b>
<b>Solar</b>	<b>18</b>	<b>188.22</b>	<b>185.69</b>	<b>30.04</b>
<b>Small hydro</b>	<b>73</b>	<b>70.82</b>	<b>2.26</b>	<b>203.46</b>
<b>Bioenergy</b>	<b>2</b>	<b>4.20</b>	<b>0.65</b>	<b>9.602</b>
<b>Total</b>	<b>104</b>	<b>409.66</b>	<b>257.79</b>	<b>332.08</b>

The share of renewable energy in total primary energy supply has grown over the last twenty years from 0.5% in 1990 to about 2% in 2012.

# Renewable energy



## Effective Green Tariffs for RES Power Plants, EUR/MWh ( 2015-2019)

- *Wind plants capacity of more than 2 MW - 101.8*
- *Biomass plants - 111.5*
- *Biogas plants - 111.5*
- *Solar plants capacity of more than 0.1 MW - 314.1*
- *Mini hydro plants - 139.6*

# Energy Policy Challenges



- High energy intensity and poor efficiency
- Declining production of domestic natural gas resources
- Energy consumption subsidies
- Market and regulatory framework
- Investment climate
- Natural gas and oil transit
- Reducing environmental impact of fuel combustion
- Institutional capacity



*Thank you  
for your attention!*

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