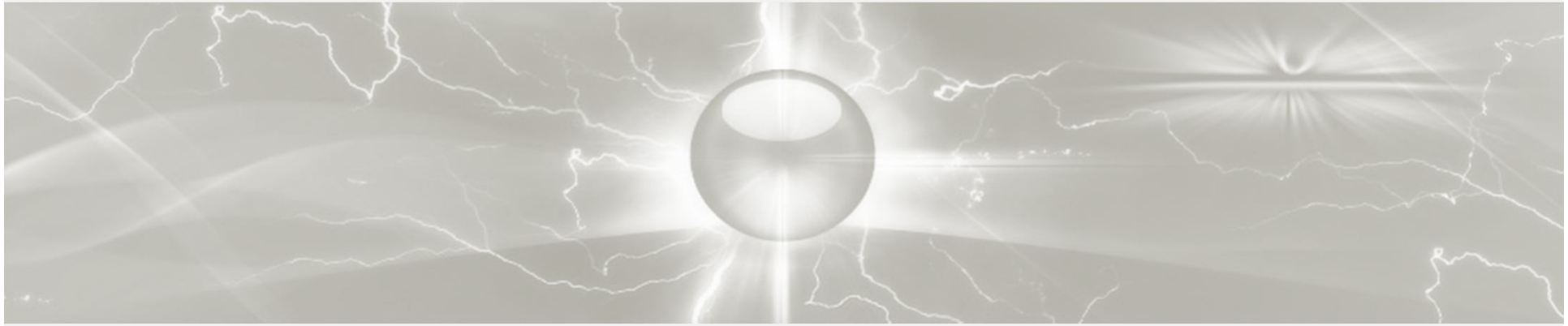
Electricity Sector of Ukraine and Climate Change



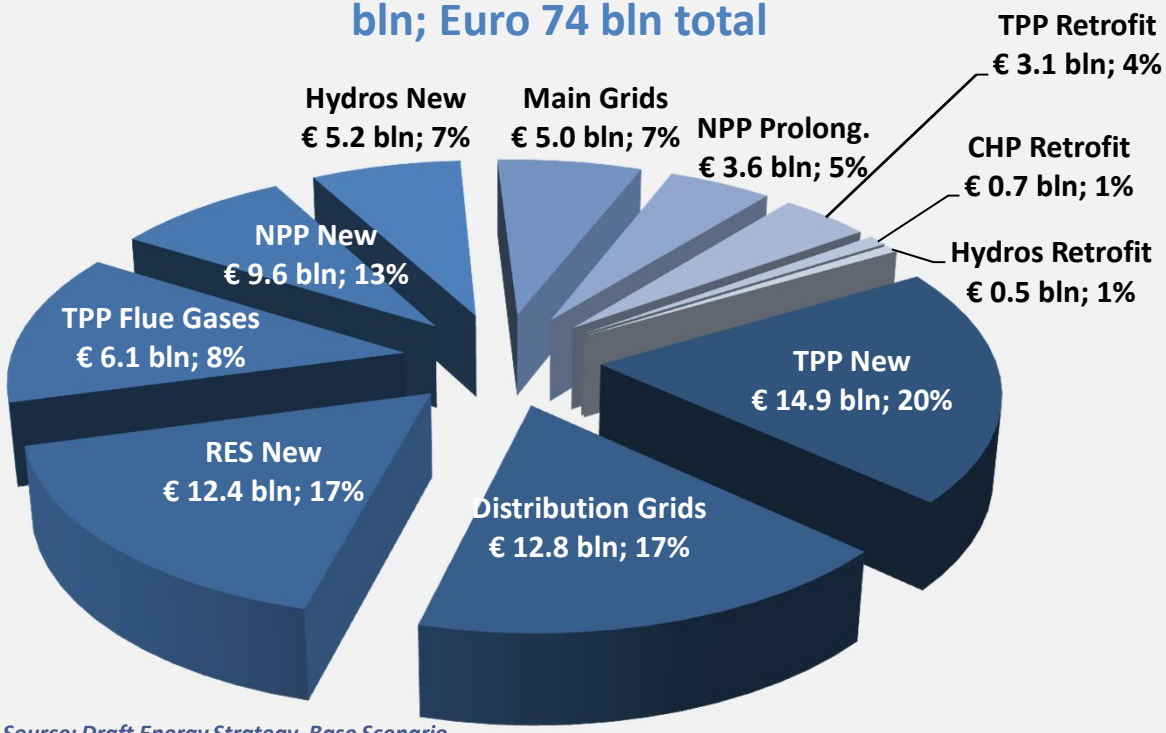
Investment climate for environmental projects: current situation and expectations for the future

17 May 2012
Kyiv

IMEPOWER

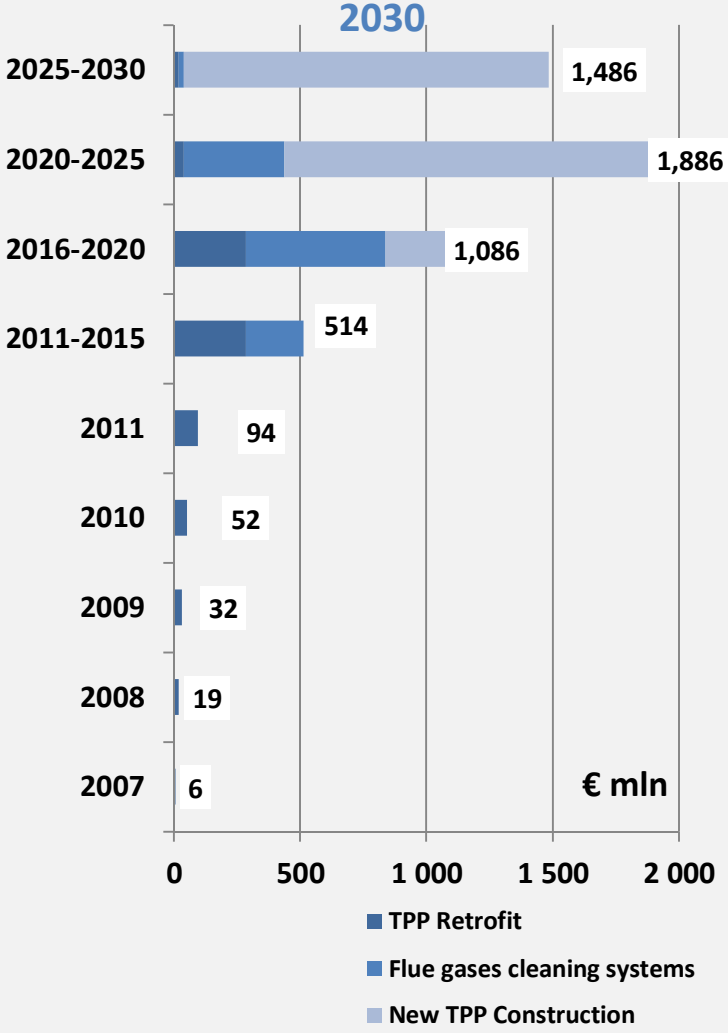
Investments for power sector

Planned Investments in power sector until 2030, Euro bln; Euro 74 bln total



Source: Draft Energy Strategy, Base Scenario

Actual and planned investments for TPP in 2007-2030



Source: NERC, Draft Energy Strategy, Base Scenario

- Some plans for investments in TPP
  - 5.5 times growth vs. 2011 in 2011-2015
  - 11.6 times growth vs. 2011 in 2016-2020
  - 20 times growth vs. 2011 in 2021 – 2025
  - 15.8 times growth vs. 2011 in 2026 - 2030

Why unfavorable investment climate

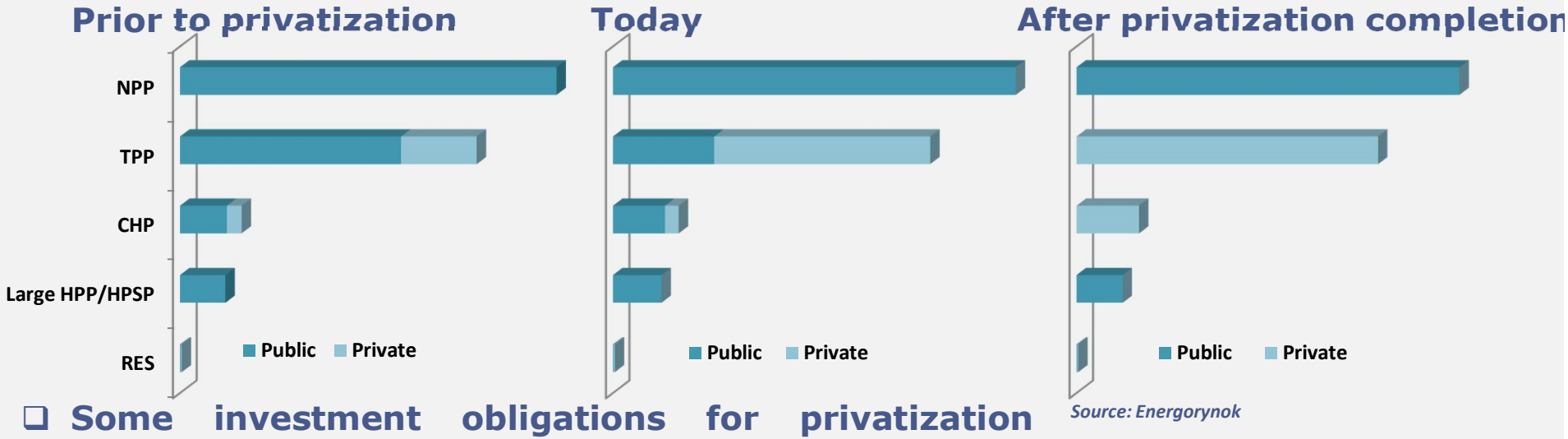
- **Some general indicators of investment climate:**
  - 2010 per capita FDI ($US): Ukraine:**159**; Poland: **962** [UNCTAD data]
  - Country risk assessment:

Sovereign risk	Currency risk	Banking sector risk	Political risk	Economic structure risk	Country risk
CCC	CCC	CCC	B	CC	CCC

Source: EIU data, March 2012

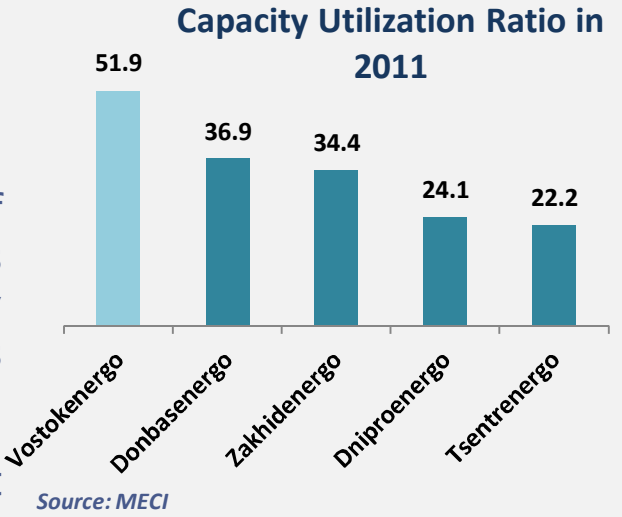
  - 152 Rank in Doing Business 2012 (IFC, World Bank data), 149 Rank in 2011
- **Why in the power sector:**
  - Dominance of public sector
  - Suboptimal electricity market model
  - Electricity tariffs not covering economic cost
  - Dependence on import gas and energy intensive economics
  - Subsidized coal industry and lack of competitive coal market
  - Lack of long term guarantees for investments payback
  - Lack of systematic public policy for power system long-term development
  - Regulatory system barriers and suboptimal taxation

Decreasing public sector dominance through privatization



Source: Energorynok

- **Some investment obligations for privatization tenderers:**
  - Provision of power plants' installed capacity at a specified level in 2011 - 2016
  - Reconstruction of power plants with provision of their compliance with ENTSO-E requirements regarding regulatory capacity, moderate capacity and maneuverability range increment within 5 years after privatization
  - Maintenance of rehabilitation level for auxiliary plant facilities



Source: MECI

- **Selection of tools to achieve these general investment objectives has been left at investor's discretion**

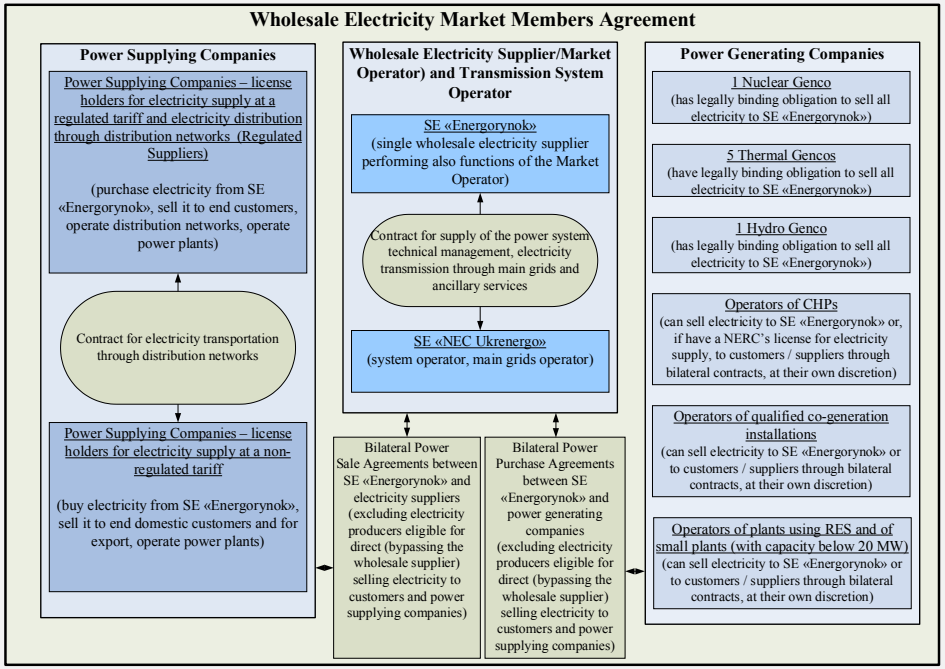
Substituting suboptimal electricity market model

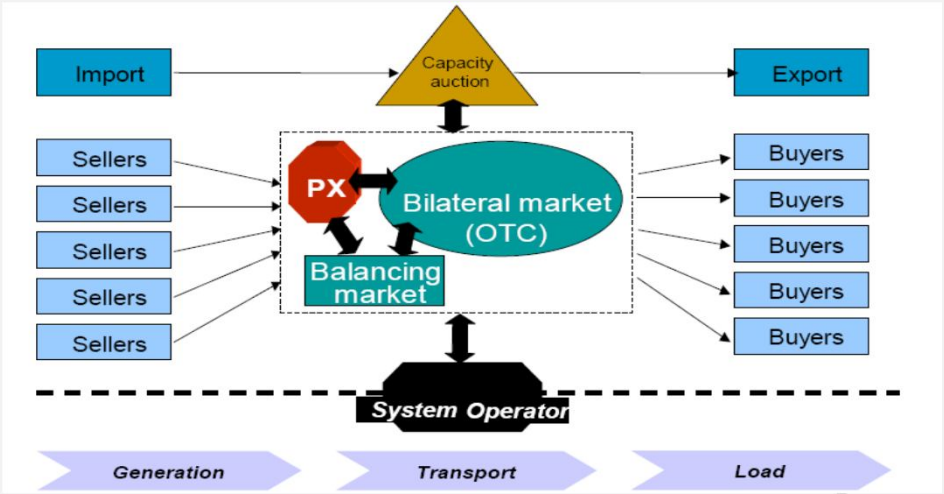
Current Electricity Market

- TPPs and some CHPs working on the basis of price bids are obliged to sell all electricity to the wholesale electricity supplier SE «Energorynok».
- For other CHPs, NPP, thermal power plants and HPPs, the NERC approves and from time to time revises «fixed» electricity tariffs using «cost plus» methodology (the tariff incorporates profit margin negotiated between the NERC and CHP operator). For RES "fixed" green tariffs are approved.
- Plants working on «fixed» tariffs are eligible for priority scheduling by the TSO for electricity generation.
- Plants working on price bids are scheduled after all power plants working on fixed tariffs (NPP, HPP, RES and relevant CHP) and compete for the remaining load.
- Some power plants (e.g. CHPs, small plants (<20 MW) are eligible for selling electricity directly to non-household customers or to power supplying companies.
- «Day ahead» segment holds the largest share of the current electricity market. Other market segments are in the infant stage.

Future Electricity Market

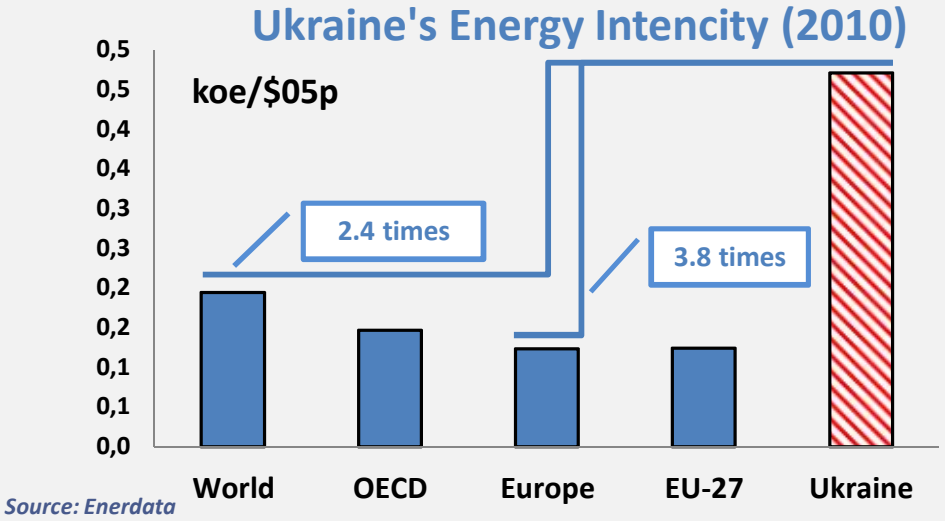
- Current wholesale electricity market is going to be entirely changed by transition of all electricity producers from the current «single buyer» model to direct contracts with electricity suppliers and eligible customers. The wholesale electricity supplier will be eliminated.
- Such new segments as a spot market, a balancing market and an ancillary services market will be established.
- Step-by-step transition to the new wholesale electricity market model is scheduled to be completed by 2014.
- The draft transitory electricity market model provides for market liberalization for TPPs holding regulated market for NPP and HPP.
- Approval of relevant legislation for transitory electricity market model introduction is expected in the coming months.





Source: NERC

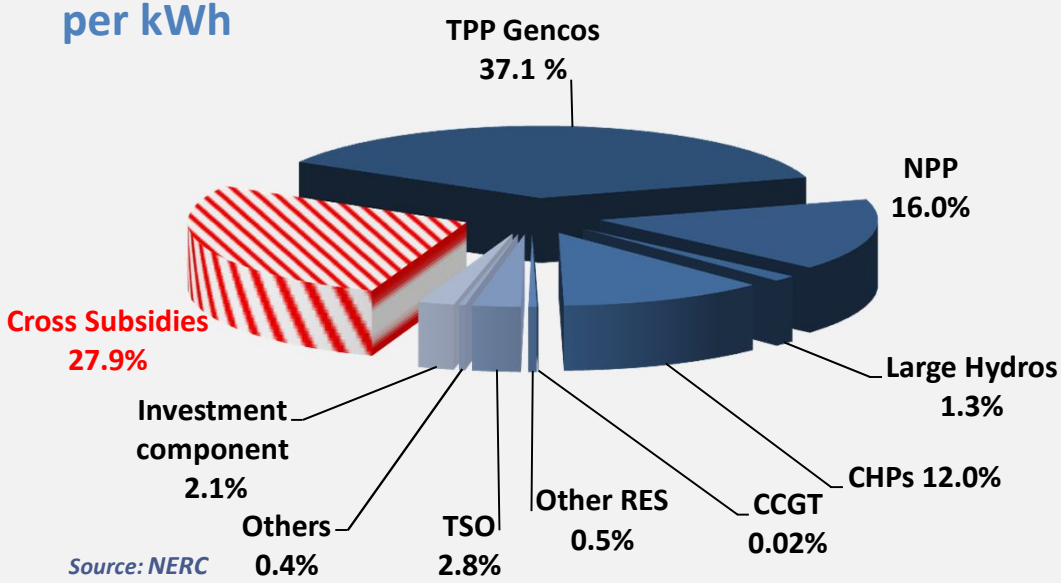
Elimination of subsidized prices – potential additional investment resource



Source: Enerdata

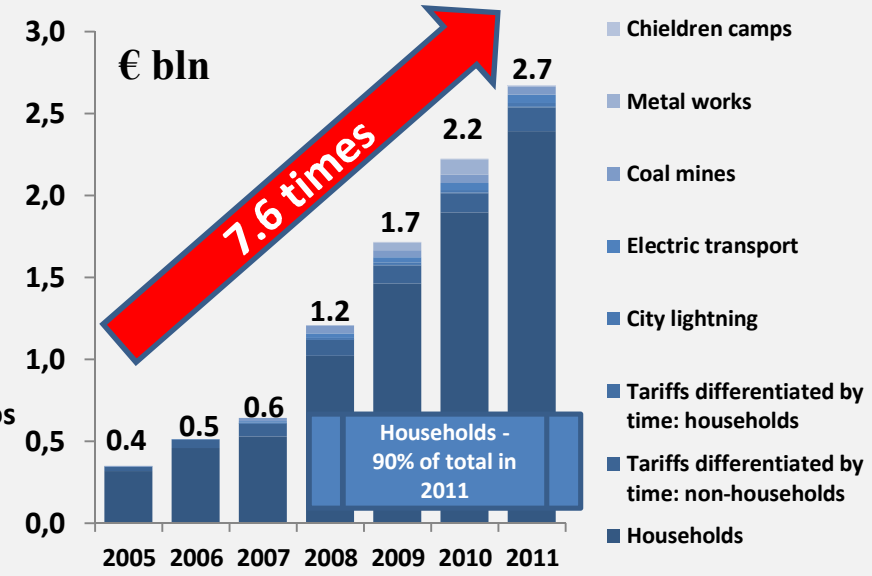
- High energy intensity of Ukraine's economy makes it sensitive to electricity prices growth adversely affecting its competitive position
- Elimination of cross – subsidization in the power sector (€2.7 bln in 2011) represent one source of funds to satisfy increasing investment needs of the sector

Wholesale electricity price in 2011 ~ 5.6 €c per kWh



Source: NERC

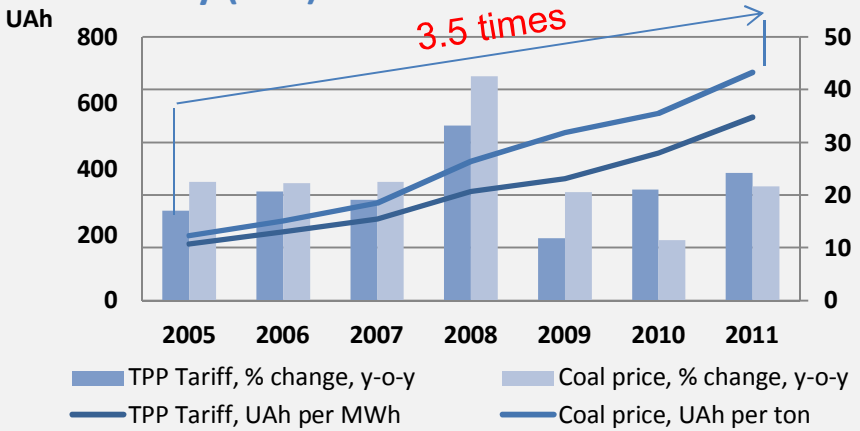
Cross Subsidies in 2005 - 2011



Source: NERC

Fuel dependence eats up potential investment resource

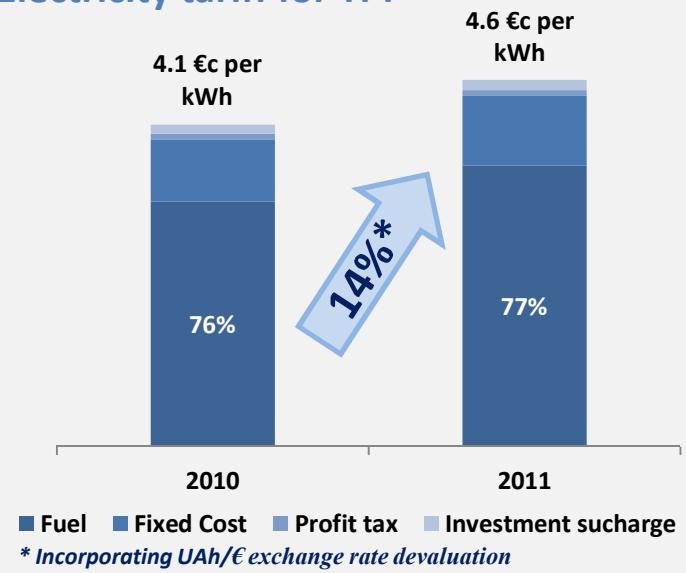
Electricity (TPP) vs. Coal Price



Source: NERC

- Ukraine has substantial coal reserves (~85% of supply through domestic extraction in 2010) but heavily dependent from Russia for natural gas supplies (~75% of supplies through import).
- State subsidies to cover cost of coal extraction were €605 mln or €7.4 per ton in 2011. Average coal cost (~€84 per ton) exceeded by ~60% average coal price (~ €58 per ton).
- Coal and especially gas prices increase account for the lion's share of electricity and heat energy increase reducing electricity and heat customers sustainability in terms of further tariffs growth caused by investment needs.

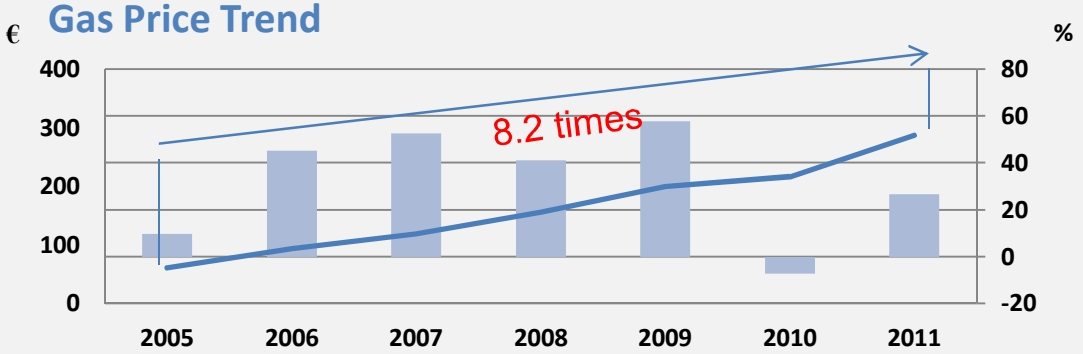
Electricity tariff for TPP



** Incorporating UAh/€ exchange rate devaluation*

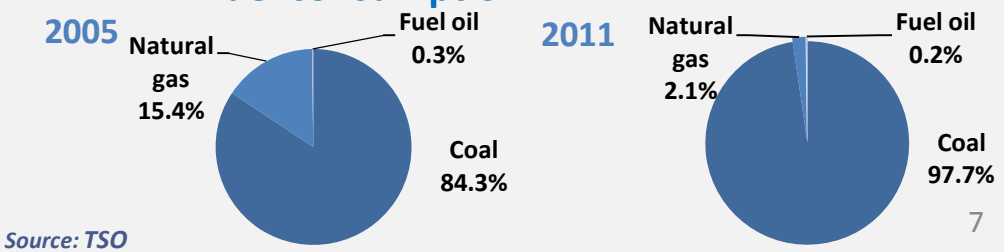
Source: NERC

Gas Price Trend



Source: NERC

TPP fuel consumption



Source: TSO

Fuel markets liberalization facilitates investments inflow

Some topics	Current status	Reform agenda
Ownership	Gas sector: Gas mining sector dominated by state utility Naftogas of Ukraine (import and domestic extraction)	Mass attraction of reputable private operators for domestic gas extraction through PPP
	Coal sector: state mines presence substantial, private sector is expending, part of private mines are operated via PPP	Mass privatization of profitable state mines, closure of unprofitable coal mines
Market	Gas sector: Monopoly of Naftogas for gas import	Gas market liberalization, free access of private operators to gas transportation system
	Coal sector: Dominance of single buyer model	Elimination of single buyer model, introduction of coal auctions
Prices	Gas market: prices for households, incl. district heating services are subsidized	Elimination of subsidization, bringing gas prices to full cost recovery level
	Coal market: Huge state subsidies to coal sector	Phased elimination of subsidies
Energy security/efficiency	Gas sector: High dependence on imported gas	Reduction of dependence and diversification of supply sources
	Coal sector: part of coal extraction is inefficient	Efficiency gains for coal extraction and development of coal import facilities

Long – term guarantees for investment payback are available for selected investors only

- Tariffs for conventional generation are regulated by the NERC.
  - No fundamentals of investment payback at the level of law for conventional generation. Secondary legislation can be easily changed (lack of sustainable legal provisions).
- Eligibility for rewarding investment component from the NERC for thermal gencos: inclusion of the project in the Action Plan for Reconstruction and Modernization of Thermal Power Plants and Combined Heat and Power Plants for the period till 2020. Initial version of the Action Plan approved by the Government but the MECI has the right to amend the action plan from time to time.
  - No right to include the projects of new construction in the action plan. It is unclear if repowering projects in the existing locations are eligible.
  - No transparent procedure and eligibility criteria for inclusion of investment projects in the action plan. Why some projects are more preferential than the others is not clear.
- There is no guarantee of investment component approval for feasibility studies approved by the MECI. No special NERC's procedure.
- Positive feature: investment component is fixed for multi – year regardless electricity output, once approved by the NERC's decree.

Long – term energy policy under revision

- Old Energy Strategy until 2030 (still effective, approved in 2006) has become outdated:
  - No linkage with contemporary economic and energy trends, Ukraine's obligations as the EnCT member;
  - Overestimation of the role of power generation, e.g. nuclear energy development;
  - Underestimation of the role of RES and energy efficiency.
- New final draft of the energy strategy for power and coal sectors approved in summer 2011 (by MECI's Board):
  - Large scale modernization of thermal power plants, development of RES and energy efficiency enhancement have been determined as one of the main priorities;
  - Main priorities for thermal generation rehabilitation: power units' service life prolongation for 15 – 20 years, installed capacity accumulation (14 GW – modernization, 11 GW – new construction), efficiency enhancement (specific fuel consumption reduction from 400 g of equivalent coal per kWh to 340 – 350 g), meeting ENTSO-E requirements as regards frequency, active and reactive power regulation;
  - RES are expected at the level of 6 GW by 2030;
  - 40% reduction in GDP energy intensity (from 0.19 kWh per UAh to 0.11)
- National action plan for UNFCCC and Kyoto Protocol implementation (2009):
  - System for GHG emissions inventory in place (expected till 2013);
  - National GHG emissions trading system in place (expected till 2013).

Opportunities and Challenges for Investments

Incentives and Opportunities

I.1.OPPORTUNITIES

- Objective need for rehabilitation of outdated power sector including enhancement in environmental performance
- Need for environmental investments declared as an important priority for the power sector

I.2. INCENTIVES

- Investment surcharge irrespective from electricity output is granted for environmental investments for thermal gencos if approved by the NERC.
- Funds spent for environmental investments are reimbursable through the investment surcharge as a component of electricity tariff

Challenges and Risks

II.1.RISKS

- No interim mechanism for the investment surcharge under transition from current 'single buyer' model to the model of 'bilateral contracts and balancing market'
- Excessively rigid regulatory environment

II.2.CHALLENGES

- No clear procedure and criteria for project selection for inclusion in thermal power plants rehabilitation action plan
- No action plan and sustainable investments reimbursement procedure for new power plants construction
- No transparent projects initiation procedure for private investors

Draft law on power generating facilities construction authorization*

Aligns Ukrainian legislation with EU Directive 2009/72/EC with respect to introduction of authorization and tendering procedures for power generating facilities

- Procedure of authorization is initiated by investors.
- Procedure of tendering is initiated by the Ministry of Energy and Coal Industry (MECI) under certain qualifying conditions.
- Simple declaration procedure for small power plants.

- Clear stages of the authorization procedure and criteria for making a decision on approval or rejection of investment by the MECI have been determined with simplified procedure for retrofit of existing facilities.
  - Qualification criteria for making a decision have been harmonized with EU Directive 2009/72/EC .
- Clear procedure for tendering has been determined.
  - MECI prepares tender conditions.
  - Government makes a decision on arrangement of a tender.
  - MECI arranges a tender.
- Preparation of regular 10-year master plan for main grids development.
- Investment incentives in the form of guaranteed reimbursement of 80% investment cost according to schedule agreed with the National Energy Regulatory Commission.
  - For reimbursement the facility should be included into the action plan approved by the Parliament, Government or MECI.

* the draft law has been prepared for the MECI and is under MECI's review today

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