UKRENERGO-2017: results of the first reforms
OPERATIONAL STABILITY OF THE UKRAINIAN ENERGY SYSTEM—ROLE OF UKRENERGO

AGGRAVATING FACTORS:

- The lowest coal stocks at the beginning of the heating season 2017/2018.
- The longest state of emergency within the Ukrainian energy system: 6 months (February 2017 - July 2017)
- Cyber attack on the Ukrenergo`s grid – 27 June 2017

ECONOMIC RESULTS OF THE DISPATCH CONTROL

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in electricity generation at the NPPs due to the Ukrenergo`s dispatch orders compared to the schedule of the SE “Energorynok”</td>
<td>(+) 453,32 m kw·h</td>
<td>(+) 338,2 m kw·h</td>
</tr>
<tr>
<td>Coal saving</td>
<td>(-) 220 thousand tons</td>
<td>(-) 160 thousand tons</td>
</tr>
<tr>
<td>Cost saving</td>
<td>13 m €</td>
<td>9,7 m €</td>
</tr>
</tbody>
</table>

Connection of four HPPs to the automated frequency and power control system with 480 MW control range
Three units of the Burshtyn TPP are commissioned for the Ukrainian energy system
NEW APPROACHES TO THE COST SAVING:

- attraction of the cheap loans of the IFIs
- Comprehensive approach to the reconstruction
- Procurements centralization and consolidation
- Price monitoring, marketing researches to prevent the over-pricing

"Effective procurement policy– “golden standard” of Ukrenergo"

**COST SAVING: STEADY TENDENCY**

**2015**  
- Internal procurements: 54,5 m €  
- External procurements: 36,4 m €  
- Saving: +189,5 m €

**2016**  
- Internal procurements: 44,8 m €  
- External procurements: 116,2 m €  
- Saving: +71,4 m €

**2017**  
- Internal procurements: 15 m €  
- External procurements: 36,9 m €  
- Saving: +219,9 m €

**PROJECTS & SAVINGS**

- Construction of the 330 kV SS “Zakhidna”  
  - Saving: 114,3 m €

- Reconstruction of six 330 kV substations within the Central and Pivnichna power systems. Installation of the reactive power compensation gears at five 220-330kV substations  
  - Saving: 190,5 m €

- Construction project 750 kV OHL RNPP - Kyivska  
  - Saving: 114,3 m €
ADDITIONAL SOURCES OF INCOME

Operating income* (м €)

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>Plan for 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>94,4</td>
<td>138,8</td>
<td>159,4</td>
<td>82,7</td>
</tr>
</tbody>
</table>

*After deduction of the once-for-all effects

Implementation of the European approaches to the assets management

- Reactive power realization
- Sales of goods, material assets
- Income from providing access to the interstate grids
- Financial income
AUCTION PLATFORM

**MAY 2017**

launching of the DAMAS auction platform on access to the allocating capacities of the Ukrainian cross-border electricity grids

**NEW APPROACHES TO HOLDING OF THE AUCTIONS**

- Effective allocation and usage of the throughput capacity of the cross-border grids;
- Growing competition (number of registered members increased by 57% to 21 members);
- Income growth from providing access to the company’s cross-border grids;
- Human factor influence minimization

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*Transition from “paper” application submission to the transparent on-line process*

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**PLANS-2018:**

Implementation of the joint auctions together with the neighboring European TSOs (Poland, Slovakia, Hungary, Romania, Moldova).

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**Income from the access to the Ukrainian cross-border electricity grids, m €**

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>0.03</td>
</tr>
<tr>
<td>2013</td>
<td>0.06</td>
</tr>
<tr>
<td>2014</td>
<td>0.37</td>
</tr>
<tr>
<td>2015</td>
<td>3.6</td>
</tr>
<tr>
<td>2016</td>
<td>2.9</td>
</tr>
<tr>
<td>2017</td>
<td>4.4</td>
</tr>
<tr>
<td>2018</td>
<td>10.5</td>
</tr>
</tbody>
</table>
EFFICIENCY AND TARIFF REDUCTION

Ukrenergo – single state company to initiate the tariff reduction on its services. Tariff for 2018 is reduced by 30%, partially by means of the Ukrenergo`s initiative and savings during the previous period.

Tariff reduction factors

- New investment policy (minimization of the investment program tariff financing by means of the IFIs` loans attraction)
- Savings in procurements
- Production processes optimization
- Nontariff income growth

"Increase of income from other activities to reduce the load tariff"
FIRST UKRENERGO`S DEVELOPMENT STRATEGY

MAY 2017 – approval of the Ukrenergo`s development strategy 2017-2026

Key goals:

Reliability and integrity of the Ukrainian energy system operation in the long-term perspective

Optimization of the company`s estimated tariff

Integration of the Ukrainian energy system and the electricity market into ENTSO-E and the European electricity market

Mission: Create conditions to ensure the customers` access to the competitive and transparent electricity market as well as equal opportunities for all market players regarding usage of the Ukrainian energy system infrastructure.

"Ukrenergo in 2026– one of the leading European TSOs for efficiency and technological evolution"

2017:

Approval of the substations comprehensive modernization and automation concept, launching of new projects with the IFIs

Reduction of the Ukrenergo`s tariff for 2018

Signing of the Agreement on the Conditions for Future Interconnections with ENTSO-E
NEW GRID INFRASTRUCTURE

CONSTRUCTED:

New 750 kV SS “Kakhovska” with a capacity of 2000 MW (95 m €)
Entries of the 330-750 OHL to the 750 SS “Kyivska”
Two entries of the 330kV OHL to the 750 kV SS “Kakhovska”: Novokakhovska-Ostrovska and Novokakhovska-Khersonska (up to 30 m €)
New 330 OHL Vuhlehirsk TPP-Donbaska № 3

REHABILITATED:

330 kV OHL Adzhalyk – Usatove № 1
400 kV OHL Mukacheve- Kapušany

Rehabilitation is proceeding:
750 kV SS “Zakhidnoukrainska”
400 kV SS “Mukacheve”
300 kV SS “Chernivetska”
750 kV SS “Vinnytska” (replacement of the AT)

Commissioning of the facilities for an amount of 132,9 m €

COMMENCED:

Construction of the 500 kV SS “Kreminska” in the Kuhansk region – tender already been held (38,4 m €, VAT incl.)
Comprehensive rehabilitation of the 330 kV SS Dnipro-Donbas and 330 kV SS “Kryvorizka”
Rehabilitation of a list of 330-750 kV SS in the eastern part of Ukraine (tenders already been held)
Implementation of the comprehensive program on replacement of the autotransformers and shunt reactors at the 330-750 kV SS.

Continuation of a course to eliminate the “bottlenecks” within the energy system
GOAL – processes optimization, cost savings, achievement of the technical level to integrate into ENTSO-E and ensuring of the Ukrainian energy system integrity

RESULT – installment of the automated systems to enable the remote control of the power equipment at the substations

Reconstruction of 13 SS, loans of the IBRD, German government via KfW, EBRD and EIB for the total amount of 352,9 m €

Approval of the new substations automation comprehensive program concept

1st order: 48 substations, implementation during 2019-2021, 4 projects were initiated to be financed by means of the IFIs’ loans, total amount 408,3 m €

2nd order: 37 substations, implementation during 2022-2027, total amount 199,7 m €

PLANS-2018:
Conclusion of loan contracts with the IFIs, financing and implementation of the projects

Automation of all 102 substations by 2026
CYBER SECURITY

Established:

- Cyber incidents response center – team of management personnel and power systems representatives

Functions:

- Information exchange about events within the company’s networks
- Prevention of threats
- Cyberattacks consequences minimization

IT-security division

(Performance of the formal and informal changes within the organizational structure of the company aimed at enhancement of the IT security)

Implemented:

- Concept to protect the substations’ automated process control system from the unauthorized access of the third parties (February 2017)
- IT security development strategy (June 2017). The strategy is to be implemented over three years
- IT infrastructure development concept as well as Ukrenergo’s office and technological networks safety provision (June 2017)
SIMPLIFICATION OF CONNECTION TO THE UKRENERGO`S GRID

Implementation of the “single window” principle

RESULT

15 days – maximum term for issuing technical specifications to connect the grid

Applications/documents submission in different ways (post, e-mail, on-line forms on the web site)

Number of application to connect the Ukrenergo`s grid increased in 1,5 times

Launching of the additional tools

Interactive grid map to define the technical capabilities of connection and on-line calculator to estimate the approximate cost of connection. Web site page with the interactive map and calculator was attended by up to 8 thousand of users

Brand new “customer-oriented” principle

PLANS-2018:

Implementation of the documents follow-up tool, extension of the interactive map to the level of the oblenergos` substations
Drafted plans of:
Transmission system code, Commercial accounting code, Electricity market guidelines (to be approved by NERC):

Ukrenergo is responsible for development of
36 document of the subsidiary legislation

24 ones are already under consideration of the Regulator

Ukrenergo participated in development of up to 56 documents

Plans-2018:
Corporatization, application submission to obtain certification, balancing market services procurement, approval of the key codes and guidelines
Synchronization without market integration is futile, market integration without synchronization is impossible.

INTEGRATION INTO ENTSO-E

336,5 m €

INTEGRATION COSTS

215,5 m €

Ukrenergo’s measures

121,1 m €

Measures of the generating companies

100,3 m €

financed by the IFIs

Signing of the Agreement on the Conditions for Future Interconnections of the Ukrainian energy system with ENTSO-E, the power system of Continental Europe

Conclusion of Memorandum with the generating companies on joint actions towards integration of the Ukrainian energy system into ENTSO-E

Drafted Action plan on synchronization by 2020

PLANS-2018:

Commencement of researches on the dynamic and static stability of the Ukrainian energy system

Researches of the TPPs units regarding frequency and power primary regulation
12.09.2017
Approval of a new Charter which stipulates for:
- Establishment of the Supervisory board along with the committees
- Transition of the Ministry of Energy functions to the Supervisory board

12.09.2017

2 January 2018
commencement of the public selection of the candidate to the Supervisory board

2018:
- Establishment of the Ukrenergo`s Supervisory board, approval of the ownership policy, creation of the compliance office due to the OECD standards
- Harmonizing of the draft strategy and financial plan
- CEO`s appointment, dismissal and activities assessment
- Creation of the anti-corruption/compliance policy
- Appointment of an independent auditor and an audit work

“Establishment of the Supervisory board – key step towards reduction of the political influence on the state enterprises”
NEW APPROACHES TO THE HR-POLICY

- Organizational structure improvements, reduction of the management levels
- Implementation of new recruitment principles: centralized open competitions for all posts from the labour market
- Advanced trainings of the management personnel
- Grading labor compensation system
- Implementation of the KPI system: quarterly and annually

“Employee compensation completely depends on a concrete result of his activities”

PLANS-2018:
- Launching of new programs: complex trainings, management by objectives, personnel involvement management
- Advanced trainings of the management personnel

<table>
<thead>
<tr>
<th>+14%</th>
<th>+35%</th>
</tr>
</thead>
<tbody>
<tr>
<td>labour productivity growth</td>
<td>average wages growth</td>
</tr>
</tbody>
</table>
NEW ASPECTS OF COMMUNICATIONS

✓ International communications
  Networking with international partners

✓ Media
  New web site, communication in English, LinkedIn

✓ Internal communications
  Corporate magazine 50 Hz, weekly digest, team buildings, corporate events

Plans-2018:
New reputation management system
Launching of the internal portal and accounts on Instagram and Twitter
Launching of the pilot master programs for the power engineers within the Kharkiv University of Urban Economy and Ivano-Frankivsk University of Oil and Gas.

Ukrenergo Laboratories
“The Nights of Energy” in Kharkiv, Lviv and Kyiv (1200 participants, 60 speakers, involvement of 51 higher educational establishments)

2017 – the year of the Ukrenergo’s brand

UKRENERGO - 2017: RESULTS OF THE FIRST REFORMS