

# **ELECTRICITY MARKET OF UKRAINE**

*PRICING MECHANISM FOR SALE OF ELECTRICITY TO  
THE WHOLESALE MARKET BY GENERATORS THAT  
WORK WITH PRICE BIDS*

## **Categories of generators that sell electricity to the wholesale market**

- **Generators that work in competitive conditions with price bids**

*five companies – thermal power plants*

In April 2003, SE Kharkov CHP – 5 joined generators that work with price bids. From March 2006 JSC Kievenergo (Kiev CHP-5 and CHP-6) began to work with price bids of WEM. In December 2009 due to lack of competitiveness these CHPs were taken out of the competitive sector

- **Generators that do not work with price bids and sell electricity to the wholesale market at tariffs approved by NERC**

*nuclear power plants*

*hydro generating and hydro accumulation power plants*

*CHPs*

*wind power plants*

*cogeneration, steam and gas and gas turbine installations*

## **Daily bids, which generators submit to the Settlement System Manager**

### **- Capacity bid for a unit or power plant as a whole**

This bid is submitted by all generators. The bid contains data on maximal and minimal capacity within the range of which the unit is potentially ready to operate in each hour of the next day

### **- Pricing bid for a unit**

- This bid is submitted by generators that work in the competitive sector. The set of proposed prices has to reflect the level of prices, at which a generator can sell electricity to the wholesale market.

Generators that work in competitive environment have to submit bids for all workable units

## **A price bid consists of the following major parameters:**

- From two to four monotonously increasing incremental announced prices for electricity, which can be sold to the wholesale market, and corresponding unit capacities. The announced incremental price of the unit is formed on the basis of variable costs of energy units (fuel costs);
- Four costs of starting a unit from reserve, which reflect the thermal condition of the unit (cold, two semi-cold, hot);
- The price of idle run of the unit;
- Minimal duration of work between consequent cycles of stopping the unit and minimal duration of idle time between consequent cycles of work of the unit;
- A sign of flexibility of the energy unit;
- A sign of mandatory work – mandatory start of the unit into operation after capital and medium repairs or reconstruction for tests with subsequent transfer to reserve;
- A sign of a unit being out of reserve because of lack of fuel;
- A sign of agreement to disconnect the unit if it is necessary for the power plant to work below minimally allowed set of equipment
- A sign of a generator's proposal to turn off a unit, which was in operation for less than 72 hours instead of another one at the CHP, which was started into operation earlier.

# Preparation of a load schedule

Every day, on the basis of forecasted consumption of electricity and capacity bids from all generators, the settlement system manager forms an hourly load schedule of the energy system as a whole and each energy unit (power plant) individually for the next day.

First of all, the load schedule includes energy units of “base” capacity – energy generating capacities, which work not under price bids, but under tariffs set by the NERC. The variable part of the load schedule is covered by capacity of generators, which work under price bids.

The settlement system manager selects working equipment of generators, who work under price bids, using the following principle: first energy blocks of generators that filed the lowest price offers are included, ranking of energy units is done according to the principle of increase of prices until the load corresponding to hourly demand for electricity is fully covered.

**The load schedule has to include, irrespective of values of submitted price offers, energy units, which provide for:**

- Minimal acceptable composition of the plant equipment;
- Composition of working units upon the request of the unified energy system of Ukraine and according to requirements of CENTREL power network (for units of the “Burshtyn TPP island”, which operate in parallel mode with UCTE countries);
- Work of units for testing after capital and medium repair or reconstruction of these blocks with their subsequent transfer to reserve or working condition.

**In accordance with the Rules of the wholesale market prices for electricity for generators that work under price bids are formed on an hourly basis and based on actual working modes of the energy unit the following payments are calculated:**

- 1. Payment for electricity** is calculated at the price of the most expensive flexible unit of the energy system (system marginal price). A flexible unit is a unit, which agrees to work in the mode "work in the course of the evening maximum of the previous day – stopping for the night – launch during settlement day" or which has a significant regulation range from maximal to minimal announced capacity. The principle of priority launch of the cheapest energy units economically prevents TPP generating companies from overstating price bids, as with sufficient coverage of the consumption, in accordance with the Rules of the wholesale market the schedule the settlement system manager would not include in the load schedule the most expensive energy units.

2. **Payment for working capacity** is calculated on the basis of actual working capacity of the energy unit and price for working capacity depending on the group, to which the energy unit belong.

All energy units, for which price bids are presented are divided into four groups depending on inclusion in the given load schedule and their state of readiness to be started:

- 1 group - units, which are included in the given load schedule for the next day;
  - 2 group – units that are in reserve for the next day, duration of launch of which does not exceed eight hours from the order of the dispatcher until maximal load and whose total capacity does not exceed the size of the necessary operating reserve approved by NERC upon request of the Dispatch center (1000 MW);
  - 3 group – other units that were not included in the composition of the first and second groups, and are provided with fuel;
  - 4 group – other units that have a sign of the unit being out of reserve due to lack of fuel, get minimal payments for working capacity, which partially compensate costs for the unit maintenance.
- Price for working capacity is differentiated depending on the group of the working capacity and is formed during the Start-End period (from 6 a.m. until 11 p.m.), in other hours it is equal to zero.

3. **Payment for flexibility** economically motivates generators that work under price bids to load energy units during peak hours and unload energy units during night hours, which in its turn contributes to streamlining of the energy system load schedule.
4. **Payment for unloading below minimal allowed composition of equipment** motivates generators to help regulate load schedule in case an incompatible mode appears in the UES of Ukraine.
5. **Payment to energy units for deviation of generation from the load schedule for creation of reserves and fulfillment of the energy system mode** compensates costs to energy units, which were unloaded to ensure capacity reserves for energy units, whose load was increased in accordance with requirements of the energy system.
6. **Payment for launching the unit** compensates the cost of launching the unit from reserve.
7. **Additional payments to the generator of electricity** – an investment component of tariffs of companies for funding reconstruction and upgrading of energy generating equipment in accordance with decisions of the Government.
8. **Decrease of payments to energy units for violation of the operational mode** motivates generators that work under price bids to observe orders of the dispatcher.

### Structure of an average tariff for electricity of generators, which work at price bids, for 2009

