# Ukraine sets out on green path

Ukraine is blessed with a huge renewable energy potential as underlined by a forecast by INFORSE, the international NGO network for sustainable energy, which said that the country has the potential to generate more than 80 TWh of electricity from renewables by 2030 and more than 120 TWh in 2050. The government has set more conservative targets, which still call for renewables to account for 30% of electricity production by 2030.

To achieve these targets Ukraine approved in April 2009 the Special Green Tariff Law, providing project developers and investors with among the highest feed-in tariffs in Eastern Europe, guaranteed against local currency devaluation. Such support allows developers to achieve an average project internal rate of return or IRR of 20-25% with a six-seven-year payback period for the majority of wind and biomass projects. This is good enough to cover Ukraine's country risk. More than 10,000 MW of wind farms are currently under development as well as several hundred MWs of small hydro, solar and biomass capacity.

## Wind leads the way

According to expert estimates, Ukraine has the potential to develop over 35,000 MW of wind power capacity with annual output of 42 TWh. Results of certified wind measurements carried out at a height of 80 meters show wind speeds of 7.5-9 meters in Crimea and along the coastlines of the Black Sea and Azov Sea. Around 4,000 MW are currently under development in Crimea with a further 6,000 MW on the coast.

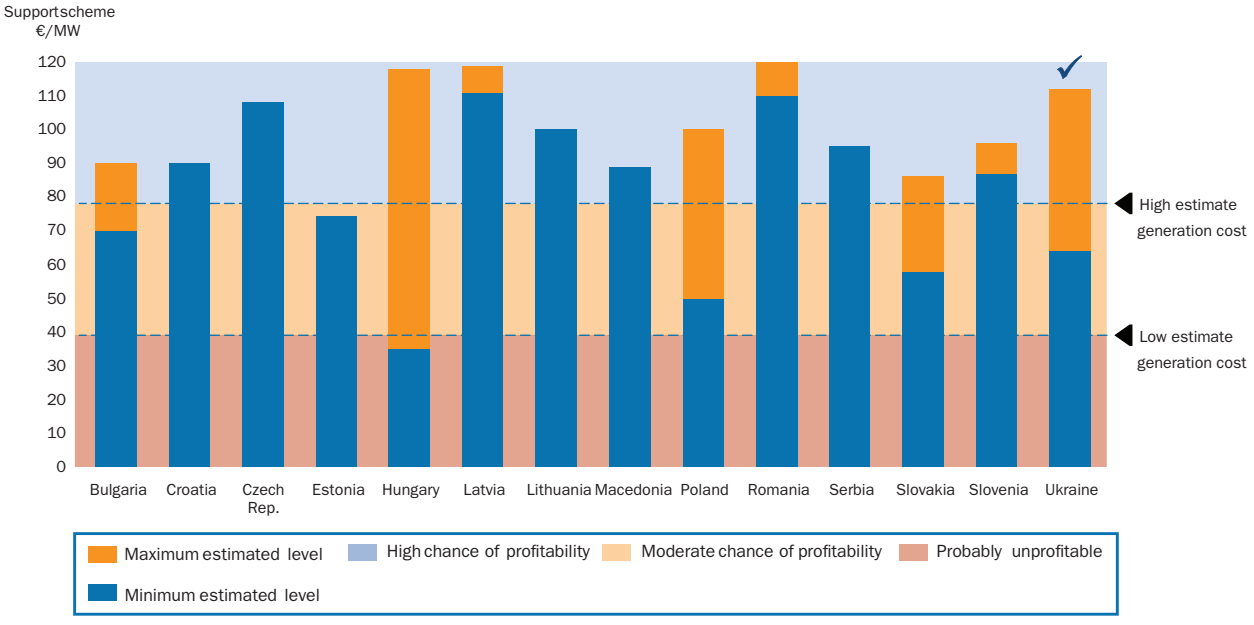
DTEK, the country's major private energy holding, announced in 2009 plans to develop 1,000-2,000 MW of wind capacity in the coming years in the eastern and southeastern parts of Ukraine.

Preparations for the development of a first 200-MW project in Zaporizhya region on the Azov Sea coast is in its final stages with one-year certified wind measurements to be completed this month and all major permits to be secured by year-end, allowing construction to be launched in 2011. This wind farm will represent DTEK's first investment in renewables aimed at balancing its large fossil fired generation portfolio.

Meanwhile, Monaco-based company EuroCape New Energy is developing a 450-MW wind farm in the same Zaporizhya region and almost a dozen smaller local developers are active including the Konkord Group which is developing 100-MW and 350-MW projects in Crimea and EuroUkrWind, which is preparing a 250-MW project in Crimea and a 750-MW project in the region of Mykolayiv.

These three companies are at relatively advanced stages of development, having already secured land titles and

## Wind support schemes in the CEE compared to generation cost




Source: Eurostat, Europe's Energy Portal, ANRE, Austrian Energy Agency, KPMG CEE Renewable Electricity Outlook

## Green tariff in Ukraine, €/MWh*

| Types of renewable energy sources | Green tariff | Methodology of new green tariff calculation | | | |
|---|---|---|---|---|---|
| | | Formula of green tariff calculation | Retail electricity tariff applicable for second voltage class consumers ** | Green coefficient *** | Peak period coefficient **** |
| | | | A | B | C |
| Wind plants with installed capacity of less than 0.6 MW | 64.6 | A x B | 54 | 1.2 | Not applied |
| Wind plants with installed capacity of more than 0.6 MW but less than 2 MW | 75.4 | A x B | 54 | 1.4 | Not applied |
| Wind plants with installed capacity of more than 2 MW | 113.1 | A x B | 54 | 2.1 | Not applied |
| Biomass plants | 123.9 | A x B | 54 | 2.3 | Not applied |
| Solar plants located on land | 465.3 | A x B x C | 54 | 4.8 | 1.8 |
| Solar plants installed on the roofs of buildings with capacity of more than 0.1 MW | 445.9 | A x B x C | 54 | 4.6 | 1.8 |
| Solar plants installed on the roofs of buildings with capacity of less than 0.1 MW and for solar plants installed on the front of buildings irrespective of their capacity | 426.5 | A x B x C | 54 | 4.4 | 1.8 |
| Small hydro plants (<10 MW capacity) | 77.5 | A x B x C | 54 | 0.8 | 1.8 |

* Net of VAT

** Set by the NERC as of January 2009 and calculated at 10.86 UAH/€ official exchange rate as of January 01, 2009

*** Set by the New Green Tariff Law (amendments to the Electricity Law) signed by the President on April 16, 2009

**** Set by the NERC

Source: IMEPOWER Consulting

grid connection for their sites, completed wind measurements and are currently finalizing environmental impact assessments and design documentation.

The energy potential of small rivers is estimated at 3-4 TWh, with the largest potential concentrated in the western part of Ukraine near the Carpathian Mountains. Many local developers are actively pursuing projects with typical individual capacity of around 1-5 MW. The largest portfolio of small hydro projects is being developed by the company Green.En and accounts for several dozens of plants with a potential total capacity of 60-100 MW.

Ukraine's large agricultural sector provides significant volumes of biomass that can be used for electricity and heat generation. Electricity production in Ukraine from agricultural and wood residues could reach 40 TWh by 2050 according to the same INFORSE study. Many biogas projects based on landfills or waste water systems are also under development. Most of these projects have installed capacity of 5-20 MWe and are being developed by local industrial and agricultural groups with access to their own biomass.

Solar projects are being actively developed in the Crimea. Active Solar has already commissioned a 2.5-MW solar PV plant. Another 5 MW will be completed by the end of 2010 with an additional 100-200 MW planned for 2011. In general, the government has announced ambitious plans to achieve the installation of 1,000 MW of solar PV systems in the Crimea in the coming years that could turn Ukraine into one of Europe's leading solar power producers.

### Comfort for developers

All this has become possible following the introduction of a new regulatory system for renewable energy in April 2009. The main advantages are as follows:

- Guaranteed electricity off-take by the operator of the Wholesale Electricity Market (WEM);
- Green tariff levels fixed until 2030 with tariffs for wind, biomass and solar plants among the highest in Europe;
- Monthly adjustment of the green tariff in line with

fluctuations in the UAH/EUR exchange rate ensuring full coverage of currency risk;

- Ability to receive co-financing via Kyoto Protocol mechanisms is an additional source of revenues for project developers;

- Government prepared to provide tax privileges for renewable and energy efficiency projects as well as reduce customs duties for the import of relevant equipment.

A guaranteed revenue stream set at the level of law is a rather unique thing for the Ukrainian power sector. No other generators (either working on fixed tariffs or participating in the "day ahead" market) can expect such favorable regulatory treatment, which makes it more challenging for them to predict their future revenues and attract financing. The new framework has been tested for more than a year as the regulator, NERC, has already approved green tariffs for more than a dozen existing renewable projects as well as adjusted green tariff levels to follow changes in the UAH/EUR currency rate.

***The government's continued role in managing the process, sending the right signals to market players and ensuring adequate investment in transmission infrastructure, will be critical to the future of renewable energy development in Ukraine***

The Green Tariff Law provides incentives for early starters. There is a sliding coefficient to the feed-in tariff applied for projects commissioned or materially modernized after 2014, 2019 and 2024 as well as the local content requirement (starting 2012 the share of raw materials, equipment, capital assets, works and services of Ukrainian origin in the overall project cost must be no less than 30% and starting from 2014 – no less than 50%).

Such a requirement combined with the huge potential market for wind turbines, masts and other equipment makes it attractive enough for some international equipment producers to shift some of their production facilities to Ukraine or establish alliances with domestic Ukrainian producers.

## Two sides to every story

Of course, there are always two sides to any story. In the case of Ukraine, the process of securing permits and approvals are complicated that make project development process rather costly and lengthy. The current procedure envisages that the green tariff be approved and power purchase agreement with the WEM Operator signed only after commissioning that makes it too risky for many foreign investors, though domestic players do not seem to consider this as a major risk. Political risk insurance available from such institutions as OPIC or MIGA could mitigate these risks.

Project financing remains another challenge since local developers (except for DTEK) usually do not have sufficient funds to provide full equity for their projects and take them to the construction stage. Rather they finance the development cost and start searching for partners who can bring remaining funds and assist with raising debt finance.

Loans from local banks, as a rule, are not available for such capital intensive projects with relatively long payback periods. In such an environment, international financial institutions (especially the EBRD and the IFC) are currently the main sources of financing as well as export credit agencies (since the major portion of equipment for renewable energy projects is anyway imported from abroad).

As an example, the EBRD is this month launching the Ukraine Sustainable Energy Lending Facility – a €50 million lending program with an additional €20 million coming from the Clean Technology Fund. These funds will be used to finance up to 70% of the project cost on limited recourse basis. It is aimed at Ukrainian developers of small and middle size renewable projects.

The long-term sustainability of the new system has yet to be proved. From one side, there have been no signs that the government or regional authorities may try to restrict investment into renewable projects or wriggle out of the obligations imposed by the Green Tariff Law. Moreover, the presence of some major Ukrainian oligarchs among RES developers serves as an additional guarantee that political forces in Ukraine will continue supporting the support system if not for the country's best interests, at least to guarantee their investments.

At the same time, the uncontrolled growth of renewable projects may sooner or later lead to the overload of the transmission system in the southern regions of Ukraine or concern among industrial customers which, at the end of the day, subsidize the difference between average electricity market prices and the generous feed-in tariffs.

The government's continued role in managing the process, sending the right signals to market players and ensuring adequate investment in transmission infrastructure, will be critical to the future of renewable energy development in Ukraine.

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