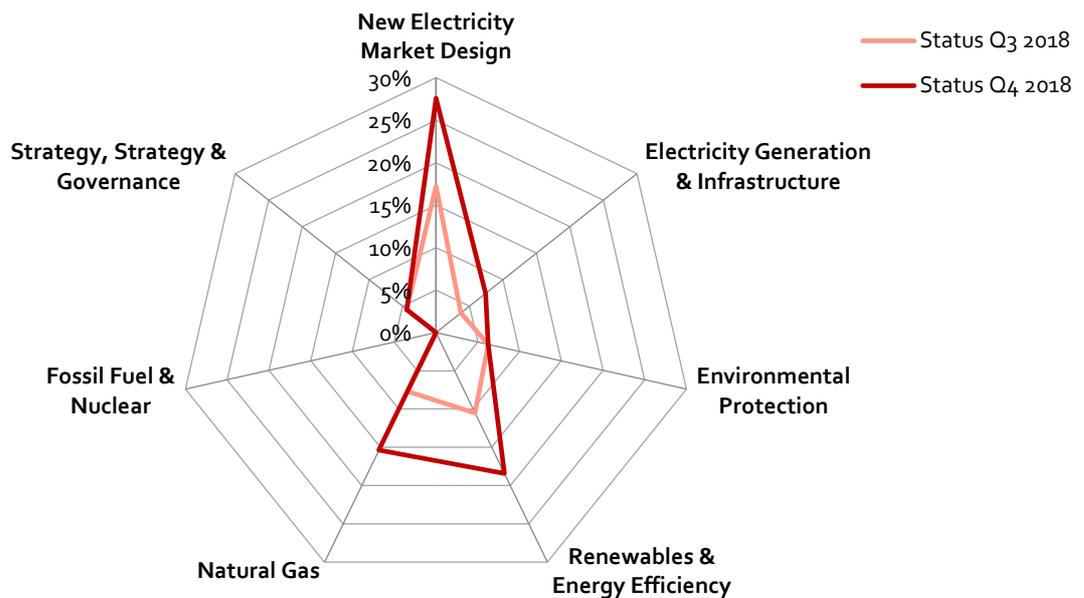


Quarterly Monitoring Report on the Implementation of Ukraine's Energy Action Plan

January 2019



Executive Summary

In the fourth quarter of 2018 certain progress was made on implementing measures on Electricity Market Design and Natural Gas. The corporatisation process of the state-owned electricity system operator **Ukrenergo** was finally unblocked allowing its unbundling to continue. On the other hand, the privatisation process of **Centrenergo** – the last state-owned operator of coal fired power plants – was temporarily halted due to participants' violations of the auctioning rules. On the gas side, a new government regulation has paved the way for prices increases for households and district heating companies. However, the move has been criticised by the Energy Community as maintaining a regulated price hinders the development of a true **retail gas market**.

Moreover, Parliament adopted a 24-fold increase of the **carbon tax** to UAH10/tCO₂. Still, this is less than the originally intended UAH 30/tCO₂ and probably not sufficient to induce behavioural changes. Tax rates, together with implementation and monitoring standards, should be further improved.

An important step forward was taken with the **draft law on renewable energy** sources passing the first reading in Parliament. The foreseen move from fixed feed-in tariffs to competitive auctions could allow a cost-efficient increase in the share of renewables. Furthermore, the reform poses an important window of opportunity to overhaul details of the support mechanism. Low Carbon Ukraine proposes (see pp.5-7) to improve the current RES support scheme by incorporating a dynamically adjusting feed-in tariff for small projects as well as providing incentives for grid-friendly location selection of renewables.

Another urgent issue for Ukraine is to develop its own **National Energy and Climate Plan (NECP)** by the end of 2019, as requested by the Energy Community. These plans can help streamline Ukraine's energy and climate policy and are necessary for Ukraine to join the Energy Union. Hence, the process of working on the NECP should start immediately.

Assessment by Sector

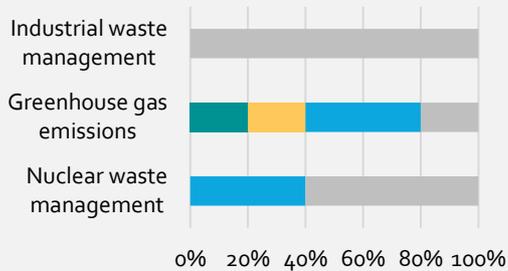
About the Assessment

IN this quarterly monitoring report, we assess Ukraine's progress on implementing the Action Plan measures for the Energy Strategy of Ukraine until 2035 (ESU). We grouped 206 actions into **seven sectors** and rated their status of implementation: completed, in political process (e.g., being discussed or provisionally adopted), overdue, or scheduled for a later date. Completed actions are classified as serving or not serving the purpose, i.e., whether or not they contribute to achieving the goals laid out in the Energy Strategy of Ukraine until 2035. The report and additional material will be made available online at www.LowCarbonUkraine.com.

Legend

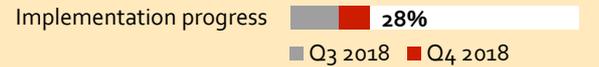
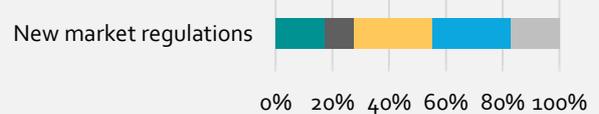
- Completed and serving the purpose of the ESU
- Completed but not serving the ESU's purpose
- In the political process
- Overdue
- Scheduled for later

Environmental Protection



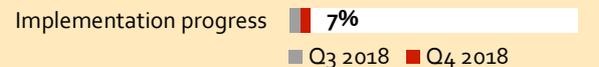
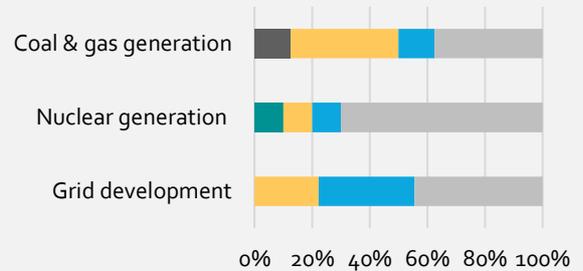
The Ministry of Environment and Natural Resources has prepared a concept for the realisation of state policy in the **industrial waste sector** aimed at implementing Directive 2010/75/EC. Changes to the Tax Code were adopted which raised the **CO₂ tax** by a factor of 24 to UAH 10 per tonne starting from 2019. Yet, due to a legal loophole, Ukrainian courts ruled that **methane emissions** cannot be taxed according to current legislation. In addition, another court ruling resulted in cancelling the right of the Ministry of Environment to calculate and impose environmental losses due to emissions. Altogether, these developments threaten the successful/timely implementation of the **National Emissions Reduction Plan**. The Ministry has submitted a cassation complaint to the Supreme Court.

New Electricity Market Design



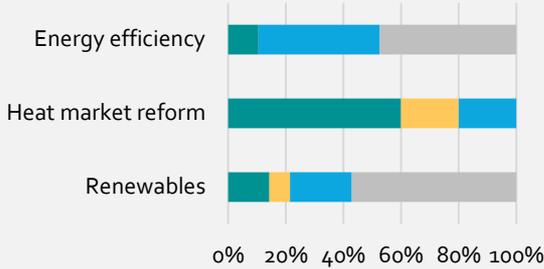
The **Ukrenergo corporatisation** process was unblocked with unbundling taking place – the company is now subordinated to the Ministry of Finance instead of the Ministry of Energy. The National Energy and Utilities Regulatory Commission (NEURC) adopted a number of crucial acts, namely **new connection charges**, and rules for the tenders for suppliers of last resort and the universal services suppliers. The supplier of last resort, state enterprise Ukrinterenergo, was appointed by the Cabinet of Ministers (CoM) without a tender until Dec 31, 2020. Small consumers were defined as having a connection capacity of less than 50 kW. Suppliers of universal services are appointed without tender as well and should supply small consumers up to 150 kW and public institutions with any connection capacity until Dec 31, 2020. This capacity range covers more than 85% of all electricity sold.

Electricity Generation & Infrastructure



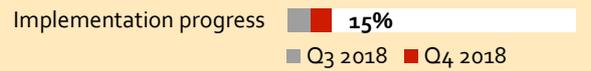
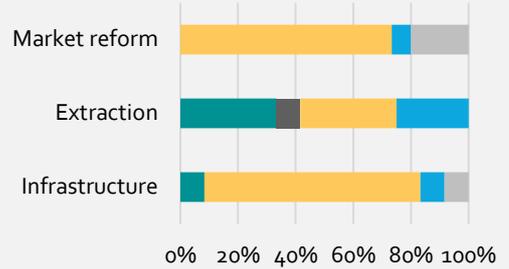
The **Privatisation of Centrenergo** was cancelled due to violations from participants and postponed without stating a new date. A Draft document with rules for **tendering new generation facilities** and **demand-response activities** was presented by the Ministry of Energy for public discussion. Ukrenergo has presented their new generation adequacy report. A draft law allowing to build units 3 and 4 of Khmelnytskyi NPP was developed by Energoatom and is now under consideration by regulation authorities. In January 2019, DTEK has announced the **acquisition of the distribution system operators (DSOs)** from Kyiv and Odessa regions – Kyivoblenergo and Odessaoblenergo. The operator of coal power plants Donbassenergo has signed an agreement with a Chinese company on the reconstruction of a coal block with a new capacity of 660 MW.

Renewables & Energy Efficiency



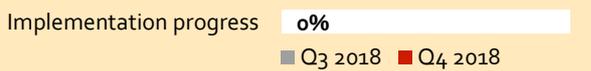
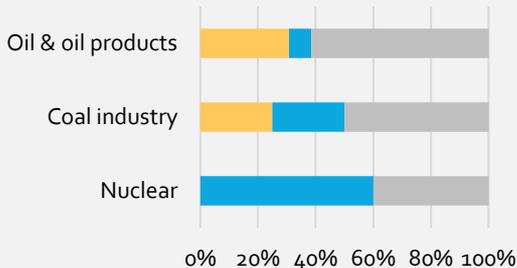
An updated draft law 8449-d on changes to the **RES support scheme** was adopted by Parliament in the first reading. The draft law includes vital changes, but lacks attention for small-scale RES generation and requires further amendments. Moreover, a Tax Code amendment granting **VAT exemption** for the import of solar panels, wind turbines as well as solar and wind inverters until 2023 was adopted. Another change to legislation eased the land use requirements for RES facilities. The government has adopted a program for the targeted **monetisation of housing subsidies** for vulnerable consumers in the area of utilities, with the first stage operational since January 1, 2019. However, this step is only intermediate, as end consumers will not directly receive money until October 2019 at the earliest. Until further changes are introduced, service providers will directly benefit from subsidies. Moreover, new **subsidy rules** foresee that if the government fails to pay subsidies to suppliers for a given period, consumers are obliged to pay instead.

Natural Gas



Launching the electronic sale of special permits for subsoil use for oil and gas fields is a major achievement of Q4 2018. Another significant step was the approval of a new procedure of access to geological information. These steps, along with scheduled PSA competitions, would allow unblocking greenfield investments and increasing gas production. However, the introduction of **daily balancing** on the gas market is again postponed due to deficiencies in the transmission system operator information platform. The Naftogaz **unbundling** model is under discussion, with five options being proposed. The drafted resolution on switching to energy units on the gas market requires approval. The new public service obligations regulation provides for a gradual approximation of **gas prices** for households and district heating companies to industry prices. Yet, it does not change the regulated scheme of supply and thus does not effectively allow **supplier switching**.

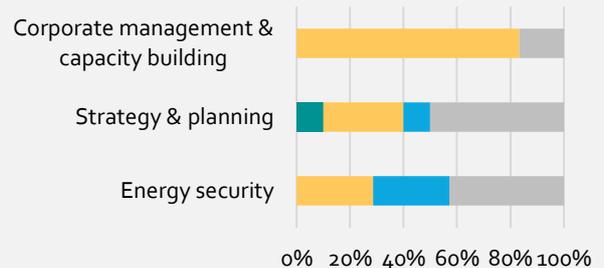
Fossil Fuels & Nuclear



The draft law on **minimum reserves of oil and oil products** was developed and submitted to the Ministry of Economic Development but not published. No amendments to the Concept of State Policy in the field of supply and transit of crude oil were proposed.

In the coal sector, the **restructuring** of state-owned assets is slow, with no lists of prospective and non-prospective mines presented by the Ministry of Energy, and a lack of financial mechanism to complete the construction of the Novovolynska 10 Mine.

Security, Strategy & Governance



The transposition of EU regulation 347/2013 on **projects of common interest** is still subject to discussion, despite the fact the Energy Community Ministerial Council decided on Ukraine's failure to comply with the Treaty. Despite progress in forming Ukrenergo's supervisory board, the **corporate governance reform** in state-owned energy companies has stalled as the draft law 6428 was not adopted. There is no public information on the draft National Plan for Protection and Resilience of Critical Infrastructure to be submitted by the Ministry of Regional Development. Due to long procurement procedures at the Ministry of Energy, the publication of the next UAEITI report is being scheduled for spring 2019.

Key Developments in Ukraine's Energy Sector

Changes to and challenges of ecological taxes

Emission taxes are an efficient tool to encourage emission reductions and raise tax revenues. On November 23, 2018 Parliament adopted changes to the CO₂ tax. The initial proposal, was to raise it from UAH 0.41 to UAH 10 in 2019, with a gradual increase to UAH 30 by 2023. However, on December 6, 2018 editorial revisions were submitted and presented by the head of the Tax Policy Committee. After these revisions, the CO₂ tax is now fixed at UAH 10 per tonne of CO₂ from 2019 onwards without further increases, and the minimum non-taxable volume of emission is set at 500 tonnes per year. These last-minute revisions to the legislative proposal were not explicitly communicated to MPs before the vote.

In a report from April 2018 the Accounting Chamber of Ukraine identified a list of critical problems relating to the administration of the CO₂ tax:

- 1) State authorities did not yet establish an effective **control system over volumes and types of emissions**. The current system is ineffective and does not stimulate the reduction of emissions.
- 2) There is no effective **forecasting methodology for ecological taxes**.
- 3) There is a lack of **effective data flow** between the Ministry of Ecology, regional authorities, ecological inspection and tax authorities.
- 4) The results of **tax inspections** and constant **monitoring of ecological tax payers are insufficient**. At least 42 instances of reporting lower emissions in tax declarations are identified. The number of inspections in 2017 was 16 times less than in 2015.

Moreover, the statistics on emissions might not be representative, since no effective control and verification exists. The year-to-year changes of physical output and emissions from 2015 to 2017 support this assumption.

Year-to-year changes of physical output and emissions from 2015 to 2017

Indicator	2015	2016	2017
Emission volumes, by stationary objects	- 15%	+ 8%	- 16%
Physical output index	- 9%	+ 4%	+ 3%

Source: State Statistics Service of Ukraine

Given the consecutive output growth in 2016 and 2017, the sharp drop in emissions does seem rather questionable.

The agreed CO₂ tax increase is a first good step, but tax levels need to increase further and implementation standards need to be improved.

New PSO rules on the gas market & gas supply billing issues

The government has adopted a new regulation on public service obligations (PSO) which provides for gradual price increases for households and DHCs by May 1, 2020 to the level of industry prices. Yet, DSO-affiliated supply companies and Naftogaz are the only suppliers entitled to operate under the PSO regime. The new rules were criticised by the Energy Community Secretariat as "laying the basis for disproportionate and discriminatory market conduct of incumbents", thus being "detrimental to the opening of Ukraine's natural gas market".

The NEURC has ruled that DSOs are not allowed to recalculate gas bills according to standard conditions (20°C). This procedure has been applied since October 2018 and has led to due payments rising by 1.5% on average. According to the NEURC, the technological cost for such a recalculation is already included in the distribution tariff. As a solution, the regulator suggests setting 0°C as the default temperature or developing technical regulations for switching to energy units instead of volumes only. The government asked the NEURC to hold unannounced inspections of all DSOs.

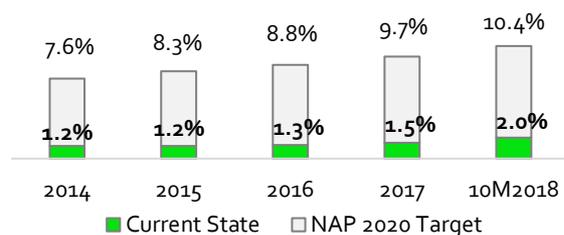
On the other hand, the Supreme Court has cancelled the 2016 government resolution (and subsequent amendments) on decreasing gas consumption standards for household consumers without metering. In doing so, they restored the standards from before 2016. Depending on the type of consumer, those standards are on average 2-3 times higher than the ones applicable in 2018. From November 2018 onwards, PSO suppliers started to bill consumers using the new standards. Retroactive calculations for 30 months were also included in the gas bills. However, they are not enforced as suppliers expect a solution from the CoM which shall design "a mechanism for compensating such debt taking into account the unreasonable losses of market participants". The Ministry of Energy has updated a draft CoM resolution setting new consumption standards.

Price increases are necessary, but the actual opening of the gas market still remains the most important task ahead. Along the way to a reformed gas market, the problem of debts in the current system still needs to be resolved.

The Draft Law on Renewable Energy Sources

In December 2018 the draft law on renewable energy sources (RES) passed the first reading in the Parliament of Ukraine. The proposed law would be an important step to make renewables support more economically viable. Even though the deployment of renewables accelerated in 2018, the current "Green Tariff" feed-in tariff (FIT) system has failed to achieve deployment targets. It also proves to be quite expensive: In 2018, renewables accounted for 8.6% of total power cost.

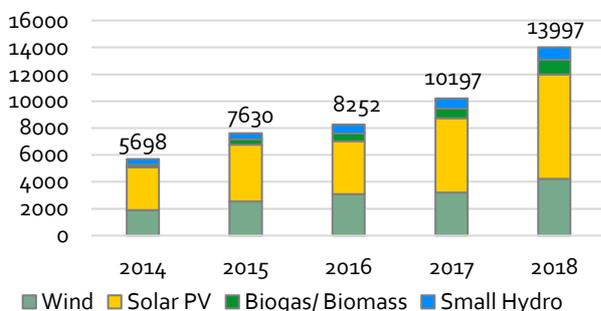
Falling short of target: RES (excl. big hydro) share in electricity generation and National Action Plan (NAP) 2020 goals



Source: SE Energorynok, NAP 2020, DiXi Group

Ukraine is at a crossroads: If the country wants to achieve the renewable energy generation goals enshrined in the Energy Strategy 2035, the current system of state support for renewables must be significantly overhauled.

Spiralling costs despite low effectiveness: Annual costs of Green Tariff in million UAH



Source: SE Energorynok, NBU, DiXi Group

The general intention of the law is to reduce the costly Green Tariff during a transition phase and then to replace it with an auctioning system, while smaller installations should still be subject to a reduced FIT in the future. This would be a step towards a more competitive, market-based renewable energy support scheme, in line with the global trend from fixed tariffs to auctioning. Yet, there is still room for improvement in some areas of the law.

Heading towards a market-based development of renewables

By aiming to replace the Green Tariff with an auctioning system, Ukraine is generally on the right track. The competitive tendering of licenses for RES projects has a number of potential advantages: By allowing competition among renewables developers, costs for the support scheme

could be greatly reduced. Moreover, deployment targets – and thus also costs – could be more easily controlled. Yet, these positive outcomes cannot be taken for granted. International experiences show that certain institutional, technological and market-related preconditions, such as a sufficient number of bidders with enough liquidity, have to be met for an auctioning scheme to achieve the desired results.

A number of positive aspects of the draft law should be emphasised. Because building a market system from scratch is always difficult, the draft law correctly proposes so-called pilot auctions to be able to refine the design after first experiences are made under the new system. In line with the recommendations of the Energy Community, the draft also proposes to start with an auctioning design that is rather simple and can evolve towards a more complex system if necessary, which makes it possible to incorporate experiences from the pilot phase. Moreover, a transition phase from the old Green Tariff system to the new auctioning system allows market participants to prepare in time.

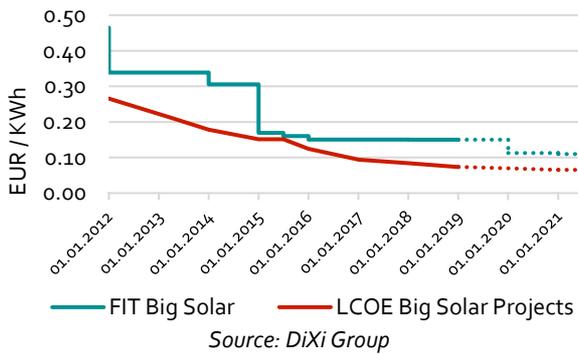
There are a couple of aspects of the law, however, that might entail difficulties and need to be addressed. The fact that RES facilities will only be responsible for grid imbalances from 2024 onwards could threaten grid stability. Also, wind farms of up to 3 MW and other RES facilities of up to 1 MW are required to participate in auctions only from 2023 onwards, which in our view is too late. The most important potential drawbacks are, in our opinion, the cost risks of wind and (mainly) solar until 2020, optimal location selection for new installations and the support for small projects. We will go into more detail regarding these three aspects.

The cost risks of high wind and solar deployment until 2020

The draft law proposes to phase out the Green Tariff from the beginning of 2020 on. At the same time, the deployment of utility-scale solar has risen rapidly in 2018: In the first ten months of 2018, 540 MW of solar plants were installed – the largest absolute increase ever for solar in Ukraine. This surge in deployment also explains the rising share of RES electricity generation (2%, 10M2018) and leads to rising costs for the Green Tariff in 2018 of almost 14 billion UAH. 2019 is the last year in which new RES projects can benefit from the current high FIT rates by signing a pre-Power Purchasing Agreement (pre-PPA). Thus, a further increase in deployment and generation is likely. 2019 could therefore see an additional – and unsustainable – increase in FIT costs.

In order to ease the cost burden that the Green Tariff poses, we recommend to lower the tariff rate already within 2019. An earlier reduction of tariffs could be justified by another argument: As shown in the figure on p.6, the FIT for big solar projects exceeds their Levelised Cost of Electricity (LCOE) – i.e. the cost of producing one kWh of electricity. Given that our LCOE trajectory correctly covers all relevant costs, renewables producers operate profitably under the current scheme as the guaranteed revenue through the FIT exceeds cost. Most importantly, the figure shows that the margin between LCOE and FIT is projected to increase.

LCOE and FIT for big solar projects in Ukraine



This shows that policy makers could immediately reduce the FIT rates to the 2020 level and thus cut costs without deterring investment into renewables – building and operating solar plants would be possible as long as the guaranteed FIT exceeds LCOE.

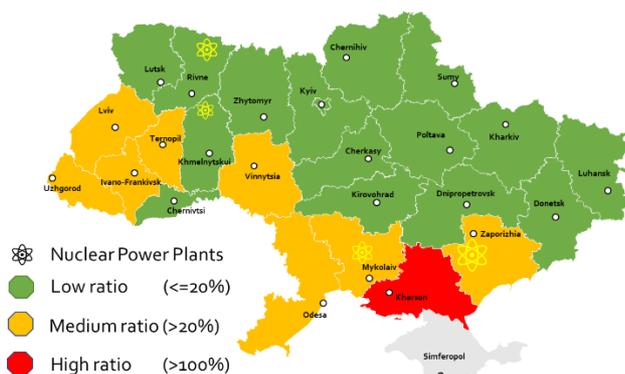
Choosing optimal locations for renewables

Overhauling the state support system for renewables could give policy makers the opportunity to influence not only *how many* new solar parks or wind farms should be built but also *where* they should be built. As of now, the initial idea of regional quotas was abandoned during the legislative process. However, optimal location selection allows to reduce balancing needs and thus costs for the Ukrainian electricity system and should hence not be overlooked.

The geographical concentration of renewables can have two main effects – grid bottlenecks and higher balancing needs. The situation for Ukraine is shown in the figure below: Renewables are distributed unevenly across the country. Moreover, higher demand/renewables ratios indicate higher chances of grid bottlenecks. In order to balance the fluctuations in power generation that higher renewables shares cause, the energy system needs to provide additional flexibility, either by conventional plants or energy storage to stand in when there is neither much sun nor wind. Unfortunately, these two balancing options are quite costly.

A complementary technology solution that reduces the need for balancing – and the occurrence of grid bottlenecks – is the smart selection of locations for wind and solar installations.

Ratio of hourly average electricity demand covered by peak RES capacity



Wind and solar electricity yields depend on the weather conditions at the respective location. The larger a country, the larger the variation of weather conditions – and thus yields. Taking advantage of this effect would reduce the balancing needs of the Ukrainian electricity system.

We incorporate smart location selection into our energy model of Ukraine to assess the size of the effect. Using hourly data on wind speed, solar radiation and temperature for up to 25 different locations in Ukraine, we show that especially wind plants can balance each other's fluctuations in electricity generation.

Wind speeds are quite different across Ukraine, so investors who get the same price per kWh at each location would have an incentive to install all their wind turbines at the windiest location of Ukraine. This would result in total wind production being very high when the wind is blowing at this location and very low when there is a still at exactly this location. At the same time, we also observe that wind speeds in Zakarpattia and Volyn oblast are almost independent (in mathematical terms, they show a correlation of 0.1 only). Figuratively speaking, this means that building five windmills in both oblasts instead of building ten windmills at one location reduces the frequency with very low and very high power production.

For solar, the picture is somewhat different. Since the sun rises and sets almost at the same time everywhere in Ukraine, the correlations are much higher than for wind. When solar electricity output in Lviv is high, it is high in Poltava too.

We employed our Optimal Dispatch Model V2.2 to estimate curtailment losses – and greenhouse gas (GHG) emissions of the entire electricity system – for two scenarios. Curtailment losses are the quantities of electricity generated by renewables that have to be “thrown away” because total generation exceeds electricity demand. This happens when there is both much sun and wind at the same time. In the first scenario, 15 GW of wind plants were installed at only one location in Ukraine. The second scenario assumed that 15 GW of wind plants were distributed evenly across the country.

Reducing curtailment losses and emissions: Two scenarios of wind power distribution

Indicator	One location	Even distribution	Difference
Feasible production	52 TWh	55 TWh	+ 3 TWh
Systemwide GHG emissions	37 Mt	33 Mt	- 4 Mt
Curtailment losses	21 %	8.5%	- 13 pp

Source: Own calculations

These findings show that distributing new RES installations – primarily wind – across the country could reduce curtailment losses and the need to balance the fluctuations of renewable power generation through conventional plants to a notable extent.

The benefits of small renewables

A second aspect of the draft law that we want to address is the missing support for small projects. An auctioning scheme, if well designed, allows that renewable targets can be achieved at relatively low costs through a transparent process. However, participating in an auction is still rather complex and expensive, which especially deters developers of small projects who lack the necessary organisational and financial resources. Moreover, the end of the Green Tariff by 2030 proposed by the draft law means that these small projects will soon find it difficult to secure loans.

It must be stressed, however, that certain small installations of renewables deserve to be particularly supported as they offer a number of benefits. They can reduce network losses, e.g. through self-consumption. Moreover, if they are well located, small renewable installations can enhance grid stability. This is especially true for small and local solar installations which also help to increase the wider public acceptance of renewables. Small and local biogas plants furthermore offer a number of particular advantages: They contribute to the reduction of emissions as they especially utilise agricultural residuals such as manure. Biomass feedstocks are abundant in Ukraine. Biogas plants also help to save fuel by co-generating heat and power and increase the flexibility of the overall energy system as a highly manoeuvrable balancing and storage option. Moreover, these plants could provide additional sources of income for small and medium agricultural companies.

If small installations of renewables are worth supporting, how should an appropriate support scheme – outside the auctioning system – look like?

How to support small renewables

A reformed Green Tariff for small installations would allow to exploit the benefits of small PV and biomass installations at reasonable cost. It could have the following components:

- 1) **Guaranteeing project-based feed-in tariffs for 10 to 20 years** (i.e. beyond 2030) would give small projects the necessary security without being too expensive.
- 2) **Setting a higher feed-in tariff for small biomass plants** that use a high share of manure.
- 3) **Introducing rules for “grid-friendly” solar development** helps to drive down costs of expensive congestion management.
- 4) **Introducing a dynamically adjusting feed-in tariff** for small installations.

The fourth point deserves special attention: Such a dynamic mechanism could in fact lead to higher deployment at lower cost compared to a fixed feed-in tariff for small installations. Germany has implemented a feed-in tariff for small installations that dynamically responds to the actual level of deployment – it could be a role model for Ukraine.

If the quarterly RES development targets are met, the responsive German feed-in tariff decreases by 0.5 % per month. If actual deployment is higher than target value, the

feed-in tariff decreases faster – if less capacity than expected is built, it decreases slower.

Such a responsive system has a number of advantages. First, it is easier to let renewable development follow a predefined track, whereas no such track is defined under the current Green Tariff. The ability to set suitable targets would therefore allow policy makers to take control over the development of small renewables. Second, if development exceeds expectations, overall costs could be managed more easily: Tariffs will automatically fall. Third, the built-in adjustment mechanism renders tedious amendments to primary legislation to adjust the feed-in tariff level unnecessary. Lastly, it ensures investor confidence: In an automatically adjusting tariff system, revenues are much more predictable than under the current system, which could collapse when costs skyrocket.

Comparison of German and Ukrainian feed-in tariffs for renewables

Technology	Germany '18	Ukraine (Green Tariff '18)	Difference (Ger : Ukr)
Wind	6 €ct/ kWh (auctions; onshore)	10 €ct/ kWh (> 2 MW)	1 : 1.6
Solar (Households)	11 €ct/ kWh (< 40 kWp; EEG 2017)	18 €ct/ kWh (< 30 kW)	1 : 1.6
Biogas	14 €ct/ kWh (< 150 kW; EEG 2017)	12 €ct/ kWh	1 : 0.8

Source: Bundesnetzagentur, DiXi Group

What remains to be done?

In sum, the overall direction of the draft law proves that Ukraine is on the right track towards a better system of state support for renewables. Especially because of the recent delays, highest priority should be given to putting the bill through as soon as possible – a legislative deadlock would imply unsustainable costs.

As to the content of the draft law, we emphasise four points: First, it is vital that further amendments do not weaken the proposed auctioning scheme. Second, further adjustments to the draft law – or secondary legislation – should focus on exploiting the benefits of renewables below the auctioning threshold by introducing a dynamically adjusting feed-in tariff based on the project duration. Third, incentives for a smart and grid-friendly location selection of renewables should be set. Finally, the FIT should be reduced already in 2019 in order to contain costs.

Ukraine's National Energy and Climate Plan

An Integrated National Energy and Climate Plan (NECP) for Ukraine

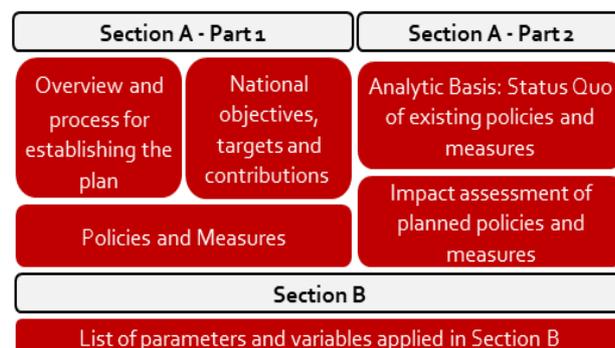
Each member state of the EU has to prepare an Integrated National Energy and Climate Plan by the end of 2019. These national plans shall ensure that the EU as a whole can meet its targets, and to coordinate policies between different countries. By 2030 the EU wants to reduce greenhouse gas emissions by 40%, improve energy efficiency by at least 32.5% and increase the share of renewables to 32%, compared to the 1990 levels. In 2017, the Energy Community¹ (EnC) recommended that their members (incl. Ukraine) shall also develop NECPs. This is a necessary step for Ukraine to participate in the Energy Union² – as the NECPs are a main tool of Energy Union governance. But the NECPs are not only instrumental for EU integration and cross-border coordination, they can also help Ukraine to streamline its energy and climate policies. A realistic plan in line with EU rules would serve as a credibility anchor that could reassure both foreign donors and investors.

NECP Timeline

2018	<ul style="list-style-type: none"> Setting targets, methodology and start stakeholder processes First EnC working group meetings
2019	<ul style="list-style-type: none"> Ongoing preparation of NECP in close collaboration with EnC, relevant stakeholders, the EU-Commission and regional partners Focus on scenario development for Section A // Part 2
2020	<ul style="list-style-type: none"> Submission of draft and feedback from peer reviews, the EnC and the EU-Commission Finalising of the NECP
2025	<ul style="list-style-type: none"> Revision and update of the NECP to ensure the achievements of the set targets
2030	<ul style="list-style-type: none"> End of 1st NECP
2031	<ul style="list-style-type: none"> Start of 2nd NECP-Period (Finalisation of 2nd NECP)

Energy Community members should have already started to set out the structure of the NECP and the process of its elaboration. In 2019 the actual drafting should begin to be ready to have a properly consulted final NECP by 2020. Given this timeline and that the final NECP will be some 100 pages long, the work on the Ukrainian NECP should be started immediately, irrespective of the election calendar.

Structure of the NECP



Guidelines by the EU and the Energy Community as well as first drafts and outlines of NECPs in various EU member states provide a template for Ukraine's NECP. Nevertheless, there will be a number of strategic and political decisions that should precede the detailed work on the Ukrainian NECP. Most importantly, which institution will be responsible for drafting the plan. But also, how it will relate to existing strategies and action plans; who will conduct modelling and quantification or how are stakeholders involved in the process.

Consequently, we think that a first urgent step is to clarify responsibilities on this document that will be crucial for Ukraine's aspiration to participate in the Energy Union.

This project is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag.

All results of the project are available online at www.LowCarbonUkraine.com.

We are grateful for feedback on this monitoring report, in particular comments how to make it even more useful for supporting the implementation of the energy strategy and contributing to a low-carbon development for Ukraine. Please get in touch via info@LowCarbonUkraine.com.

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¹ The Energy Community consists of the EU and nine countries in the EU's neighbourhood that want to become part of the EU internal energy market.

² The Energy Union is a political project of the Juncker Commission to ensure that "Europe's energy supply is safe, viable and accessible to