ENERGYWATCHGROUP

IET International Energy Transition

GET FIT for Ukraine

Advanced Funding Options for Renewable Energy Projects

Prepared for:
State Agency on Energy Efficiency and Energy Saving of Ukraine

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1. Executive Summary

This report provides an analysis of the Ukrainian electricity system describing the applicability of the GET FIT concept to the national conditions.[1]

1.1. Background of the Ukrainian Electricity Market

The National Renewable Energy Action Plan (NREAP) of the Ukraine aims to increase the share of renewables to 11 percent by 2020 in terms of gross final energy consumption and electricity generation).[2] As of 2019, the share of renewable energy sources in total power consumption amounts to 2.5 percent (8.7 percent including large hydro).[3] **In order to achieve the target of 11 percent renewables by 2020, additional investment of about € 10 billion is required**.

When comparing the "green tariffs" for renewable energy technologies with tariffs for fossil-fuel based technologies it becomes apparent that some renewable energy technologies are already cost-competitive with new fossil fuel generation. However, other renewable energy technologies, namely geothermal, biomass and (previously) solar PV, are still more expensive per kilowatt-hour – if negative externalities and decommissioning costs for nuclear power plants and nuclear waste are not taken into consideration.

1.2. Gap funding as part of the GET FIT concept

The GET FIT (Global Energy Transfer Feed-in Tariffs) concept was first developed by Deutsche Bank in 2010. Later, it was adopted by a number of international organizations (e.g. KfW, UNDP) and implemented in several countries around the world, including Vietnam, Mozambique,[4] Zambia[5] and Uganda.[6]

[1] Other secondary documents – the specific grid codes, application forms and other technical and administrative details – have not been analysed in detail.
[2] https://www.energy-community.org/dam/jcr:52178d64-eb7c-4edc-aa69-afe48d065826/NREAP_2014_UA.pdf
[3] https://www.energy-community.org/dam/jcr:3aa5bfa0-b9c7-40c2-a413-1d1e3c091ba2/UE_Progress_RE_2017.pdf
[4] https://www.getfit-moz.org/about-getfit
[5] https://www.getfit-zambia.org/
[6] https://www.getfit-uganda.org/

The crucial component of the GET FIT concept is gap funding, i.e. funding the renewable energy power generation costs which exceed a certain cost benchmark. There are several options that can be determined as the appropriate and feasible cost benchmark.

- Option 1: Costs of existing coal fired power plants (per kWh)
- Option 2: Costs of new coal fired power plants (per kWh)
- **Option 3: Costs of new, large-scale renewable power plants (determined via auctions)**

Option 3 could be beneficial for the Ukraine because it would allow for the development of a large variety of renewable energy technologies. In addition, this approach could create a balance between the support for large-scale projects via auctions and smaller-scale projects via feed-in tariffs and the GET FIT concept. The first pilot auctions, which will be executed in January 2020, could set the cost-benchmark for the Ukrainian GET FIT program. Some countries have opted to also finance grid connection or grid expansion costs via the GET FIT program.

Financing certain cost related to the deployment of renewables via GET FIT can have positive impacts on electricity prices and subsidies. The GET FIT concept can **reduce electricity prices for final consumers** since not all costs of the electricity systems will be passed on to the final consumers. In turn, the **existing subsidies for low-income households can be reduced**, thus **freeing government finance** for other investments.

1.3. Next Steps and Further Research

Gap Funding and Cost Benchmarks

- Option 3 (using the cost benchmark of large-scale renewables) seems to be most appropriate for the Ukraine. Further research is required on how to determine this benchmark (e.g. the results of the first onshore wind pilot auction, the average value of several auction rounds or other approaches).
- The total costs for RE deployment need to be modelled, including estimates of GET FIT funding required.

Covering grid expansion cost via GET FIT

- The grid expansion costs for different RE power generation technologies in the Ukraine need to be further investigated.
- Grid upgrade costs as a share of total project costs need to be determined.
- An assessment of the financial project viability needs to be executed to understand the effects of covering grid upgrade costs via GET FIT (number of projects that become financially viable).

Organization of payment flows with the GET FIT concept

- A detailed assessment of the optimal payment flows within the existing Ukrainian framework is necessary.
- The creditworthiness of the key institutions potentially involved in the GET FIT program is required (impact on cost of capital for IPPs).
- Existing guarantees and other de-risking policies to reduce the cost of capital in the Ukraine need to be investigated.

Funding sources and transparent management

- The funding sources for GET FIT Ukraine need to be further specified.
- The advantages and disadvantages of a Trust Account or a Revolving Fund need to be further detailed.

Engaging donors in the GET FIT concept

- A more detailed analysis of the existing donor landscape is necessary (IFC, etc.). Is additional funding provided via EU budget? Is additional donor finance provided by other EU countries?
- What are the requirements and pre-qualifications of the different funding sources?
- In addition, all donors need to be familiarized with the GET FIT concept.
- Donors need to be approached to see whether they want to channel some of their future contributions through the GET FIT fund.
- The GET FIT concept would need to be presented to potential future donors.
- Further research is required on how finance from the Green Climate Fund can be acquired an integrated into the GET FIT concept.
- Other funding options such as the Climate Investment Funds (CIFs) and the Global Environmental Facility (GEF) need to be further investigated.

2. Background Information on the Ukrainian Electricity System

2.1. The Ukrainian power mix and the growth of renewables

Traditionally, the Ukrainian electricity system is dominated by nuclear (more than 50 percent) and coal (about 30 percent). As of 2019, the share of renewable energy sources in total power consumption amounts to 2.5 percent (8.7 percent including large hydro).[7] The National Renewable Energy Action Plan (NREAP) of the Ukraine aims to increase the share of renewables to 11 percent by 2020 in terms of gross final energy consumption and electricity generation).[8]

The renewable energy sector started to grow as of 2014. Until now, about € 2 billion have been invested, mostly into solar PV and wind energy projects. Regarding distributed RE generation total investment of households amounted to € 180 million. The total installed renewable capacity (excluding hydro) amounts to 2.2 GW. In the first two quarters of 2019 alone, about 900 MW of new capacity were added due to very attractive FIT rates. **In order to achieve the target of 11 percent renewables by 2020, additional investment of about € 10 billion is required**. Projects in planning already account for about € 4 billion.

To further spur the development of renewable energy sources and other green technologies in the Ukraine, the government is currently developing the concept of a Green Investment Fund. Based on examples of investment and operating activities of UK GIB (UK), the fund should cover some of the initial upfront investment costs. The funding can vary and cover up to 10, 15, 20 or 30 percent of upfront investment. The remaining 70 percent should be covered by the owner/initiator of the project. The Fund will be filled with working capital from the sale of its share in realized projects and/or from receiving a part of profit from the feed-in tariff.

2.2. A Complex Subsidy System

Generally, the costs of the energy system are covered by the end-user. However, not all end-users can contribute to financing the electricity system equally. Especially low-income households benefit from subsidies to cover their costs for heating and electricity.

[7] https://www.energy-community.org/dam/jcr:3aa5bfa0-b9c7-40c2-a413-1d1e3c091ba2/UE_Progress_RE_2017.pdf
[8] https://www.energy-community.org/dam/jcr:52178d64-eb7c-4edc-aa69-afe48d065826/NREAP_2014_UA.pdf

The level of the subsidy is determined for each household individually, depending on the aggregate income. The formula for calculating the size of the subsidy is based on the dependence of family income on the level of two subsistence minimum per person and expenses that do not exceed 15% of the total income of such family.

Table 1: Social standards for calculating housing subsidies

Electricity consumption		
Heat	Heat period	30 kW h 1 m² heating area *corrective index
In homes equipped with stationary electric stoves	in the presence of centralized water supply of hot water	110 kW h for 1 person family + 30 kW h for another member, but no more 250 kW h per month
	in the absence of centralized water supply of hot water	130 kW h for 1 person family + 30 kW h for another member, but no more 270 kW h per month
In homes not equipped with stationary electric stoves	in the presence of centralized water supply of hot water	70 kW h for 1 person family + 30 kW h for another member, but no more 210 kW h per month
	in the absence of centralized water supply of hot water	100 kW h for 1 person family + 30 kW h for another member, but no more 240 kW h per month.

Source: Cabinet of Ministers No. 409 "On the establishment of state social standards in the field of housing and communal services" from 06.08.2014.

2.3. The "Green Tariffs" Regime in the Ukraine (Feed-in Tariffs)

Currently, Ukraine has a single-buyer electricity market with wholesale trading. The State enterprise Energorynok buys electricity from independent power producers (IPPs). The National Energy and Utilities Regulatory Commission of Ukraine (NEURC), the regulatory authority in Ukraine, establishes tariffs for all IPPs, including renewable energy producers and conventional power producers. The power purchase agreements under the feed-in tariff program for renewables are backed by a state guarantee at least until 2030.

The feed-in tariff, or "green tariff",[9] is granted to all renewable energy technologies. Tariffs differ for each technology and project size (see Table 1). In the case of hydro power, only plants up to 10 MW are eligible. Additionally, the electricity produced from private households equipped with solar panels or wind turbines are limited to an installed capacity of 30 kW. The feed-in tariff regime also includes a premium payment for local content. If more than 30% of equipment is sourced nationally, the premium payment will be triggered.

Table 2: Green tariff rates by types of the RES and date of commissioning of the RES

RE technology	Category/Installed capacity	Feed-in tariff levels (EURcent/kWh) for power plants commissioned between 01.17 and 12.19
Residential solar	Free-standing	15.02
	Rooftop	16.37
Wind onshore	Smaller 600 kW	5.82
	600 to 2000 kW	6.79
	More than 2000 kW	10.18
Hydro	Smaller 200 kW	17.45
	200 to 1000 kW	13.95
	1 MW to 10 MW	10.45
Biomass/biogas	All	12.39
Geothermal	All	15.03

Source: NEURC Resolutions[10]

The Ukrainian government is planning to implement renewable energy auctions for large-scale renewable energy projects. Feed-in tariffs will continue to be available for smaller scale projects. The relevant law passed the second reading of the parliament in 2019. Accordingly, all project developers that have already started and have obtained a pre-PPA can finish their projects under the existing FIT regime until 2020. However, the applicable FIT rate will be reduced by 25%. Feed-in tariffs will continue to be available for all solar projects up to 1 MW and all wind projects up to 5 MW. The first pilot auctions will be run in January 2020 and could set the cost-benchmark for the Ukrainian GET FIT program.

[9] http://www.res-legal.eu/search-by-country/ukraine/single/s/res-e/t/promotion/aid/feed-in-tariff-green-tariffs/lastp/350/
[10] https://www.energy-community.org/dam/jcr:3aa5bfa0-b9c7-40c2-a413-1d1e3c091ba2/UE_Progress_RE_2017.pdf

3. Understanding the GET FIT Concept

3.1. What are the core elements of the GET FIT concept?

The GET FIT (Global Energy Transfer Feed-in Tariffs) concept was first developed in 2010 (DB Climate Change Advisors 2010) and 2011 by Deutsche Bank (DB Climate Change Advisors 2011a; DB Climate Change Advisors 2011b).

Later, it was adopted by a number of international organizations (e.g. KfW, UNDP) and implemented in several countries around the world, including Vietnam, Mozambique,[11] Zambia[12] and Uganda.[13] The implementation in other countries is currently planned (e.g. Namibia and Mozambique).[14]

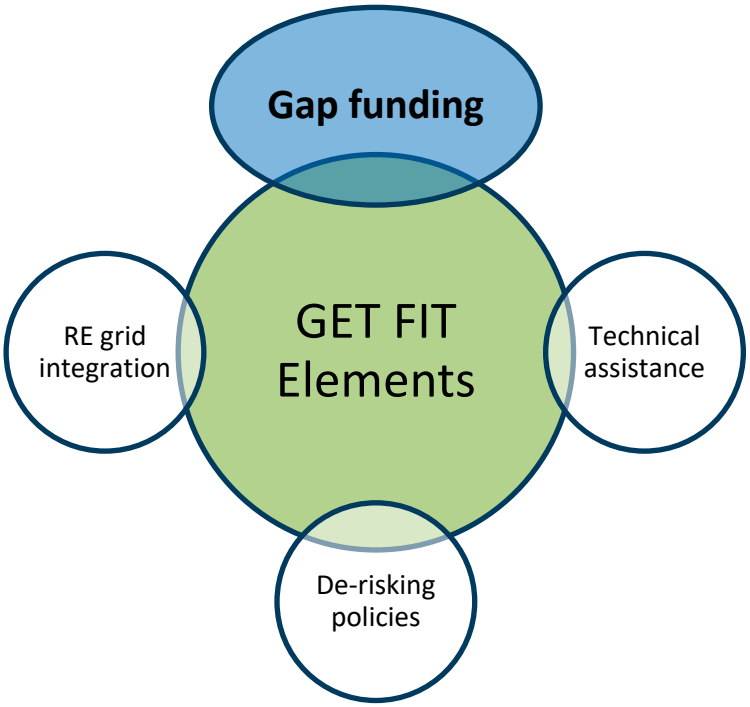
The GET FIT concept consisted of primarily four policy elements:

a. **Gap funding** for costs exceeding a specific strike price or cost benchmark
b. Technical assistance for renewables
c. De-risking policies for private sector investment
d. Renewable energy grid integration

This short study primarily focuses on the first aspect, namely **gap funding** for costs exceeding a pre-determined strike price or cost benchmark. The basic design option related to gap funding are described in the following Section. The other elements, namely technical assistance, additional de-risking policies for private sector involvement and assistance for integrating renewable energy technologies into the Ukrainian electricity systems will not be further discussed in this short report.

[11] https://www.getfit-moz.org/about-getfit
[12] https://www.getfit-zambia.org/
[13] https://www.getfit-uganda.org/
[14] http://unohrlls.org/custom-content/uploads/2016/12/UN-Regional-Meeting-December-2016-GET-FiT-v2.pdf

Figure 1. GET FIT design elements



Source: IET based on (DB Climate Change Advisors 2010; DB Climate Change Advisors 2011b)

3.2. How do you determine the funding gap and the relevant cost benchmark?

The GET FIT concept was developed in a time when new renewable energy power generation capacity was still more expensive than new fossil fuel-based power plants. Therefore, the initial GET FIT concept was developed to provide gap funding for renewables in order to cover the cost difference between fossil fuel-based power generation and RE based power generation.

Today, many renewable energy technologies, namely wind onshore and solar PV, have developed into one of the least cost power generation technologies available in many countries around the globe (IEA-RETD 2016). However, in the Ukraine, coal fired power generation is still less expensive than renewable energy power generation – if negative environmental externalities are not taken into consideration in terms of CO2 taxes or alternative instruments.

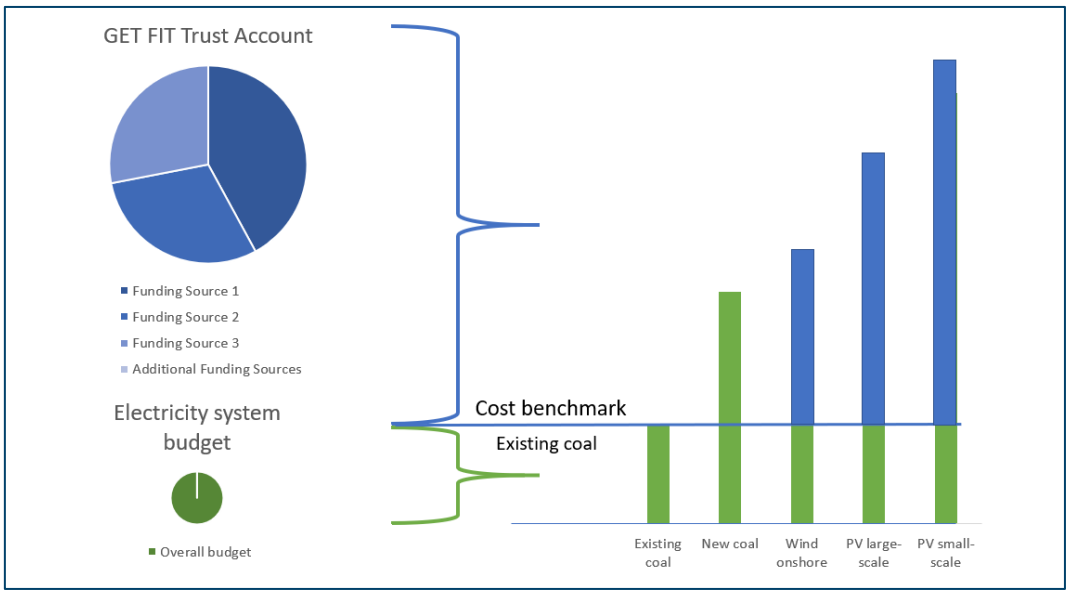
When implementing the GET FIT concept one of the most important aspects is to determine the gap that needs to be financed. In other words, what cost will be covered via the general electricity system and what cost will be covered via GET FIT? It is necessary to determine a certain cost benchmark or cut-off point. Below this benchmark, all costs will be covered by the Ukrainian electricity systems. Above this cost benchmark, all costs will be financed via GET FIT. There are several options that can be determined as the appropriate and feasible cost benchmark.

- Costs of existing coal fired power plants (per kWh)
- Costs of new coal fired power plants (per kWh)
- Costs of new, large-scale renewable power plants (e.g. onshore wind costs per kWh)

a. Costs of existing coal fired power plants

GET FIT could finance all costs exceeding the costs of already operational coal fired power generation. In other words, the avoided (fuel) costs of coal-based power generation would be the decisive benchmark.

Figure 2. Funding based on cost benchmark "existing coal" (illustrative)



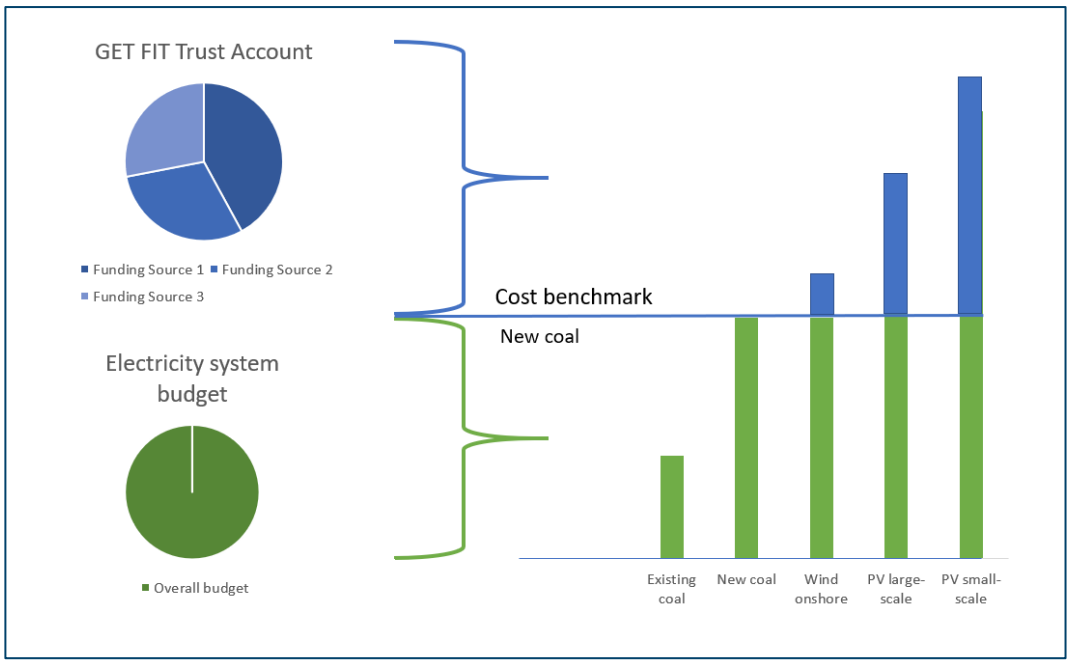
Source: IET

Since the cost for already running and amortized coal fired power plants in the Ukraine are very low, considerable funding via GET FIT would be required. If, for instance, the cost of existing coal generation in Ukraine is 0.5 UAH, then all costs for renewable energy projects higher than this would be covered by GET FIT. However, due to the large amount of funding required, this benchmark is likely not feasible and higher cost benchmarks should be taken into consideration.

b. Costs of new coal fired power plants

Another option is to finance all cost above the costs of new coal-fired power plants via GET FIT. In other words, the LCOE of new coal fired power plants would become the decisive benchmark. As indicated by Figure 3 below, the total funding required via the GET FIT Trust Account would already be lower than under option a). discussed above. Only the costs exceeding the costs of new coal (per kWh) would be covered. However, this approach is difficult to implement in the Ukraine, since there are no new coal-fired power plants in planning and no cost data about the LCOE of new coal is available.

Figure 3. Funding based on cost benchmark "existing coal" (illustrative)



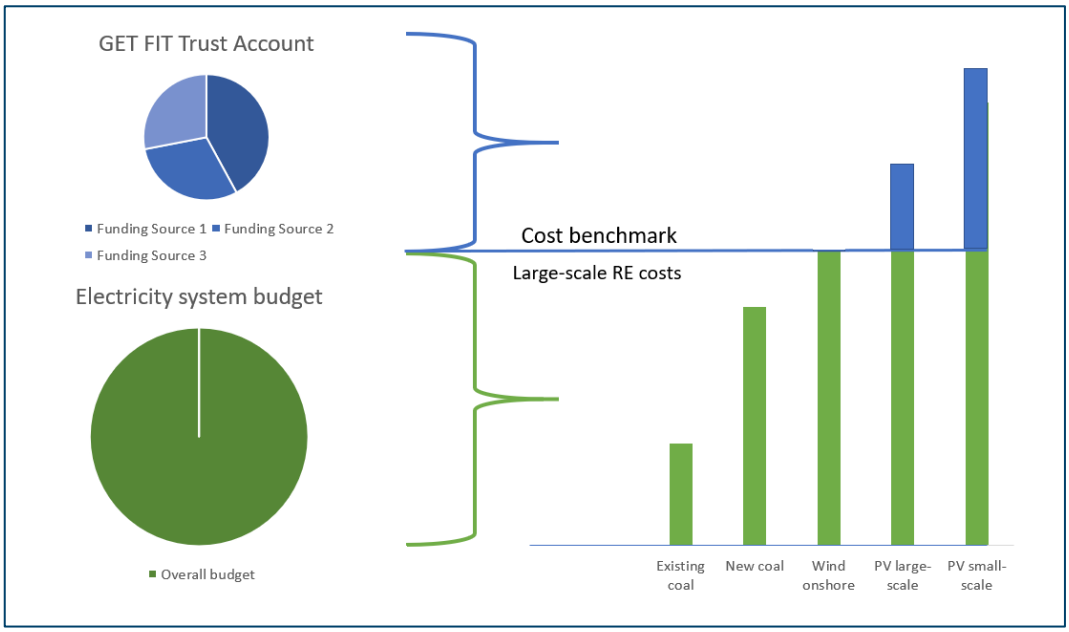
Source: IET

c. Costs of new, large-scale RE projects

The third option is to finance all cost higher than the costs of new, large-scale renewable projects. For instance, the cost for a new, large-scale (100 MW) wind energy project in the Ukraine could be as low as 2 UAH. These prices for large-scale RE projects will be determined via competitive bidding (auctions) in the Ukraine as of January 2020. The results of these auctions could serve as a cost benchmark for the GET FIT program.

There are still several renewable energy projects that are more expensive, namely smaller-scale RE projects and less mature technologies. Small-scale technologies include roof-top PV, community owned wind projects or small-scale biomass projects in rural areas. Less mature technologies include geothermal, offshore wind and others. The additional costs for smaller-scale RE projects and less mature technologies could be covered by the GET FIT funding.

Figure 4. Funding based on cost benchmark "large-scale RE costs" (illustrative)



Source: Author

This approach could be beneficial for the Ukraine because it would allow for the development of a large variety of renewable energy technologies. In addition, this approach could create a balance between the support for large-scale projects via auctions and smaller-scale projects via feed-in tariffs and the GET FIT concept. The advantages of small-scale renewable energy projects and community owned projects are frequently overlooked because it is sometimes difficult to monetize these benefits (e.g. reduced costs for grid expansion, higher acceptance with the affected communities, opportunities to participate financially in the energy transition, etc.).

Next Step and Further Research

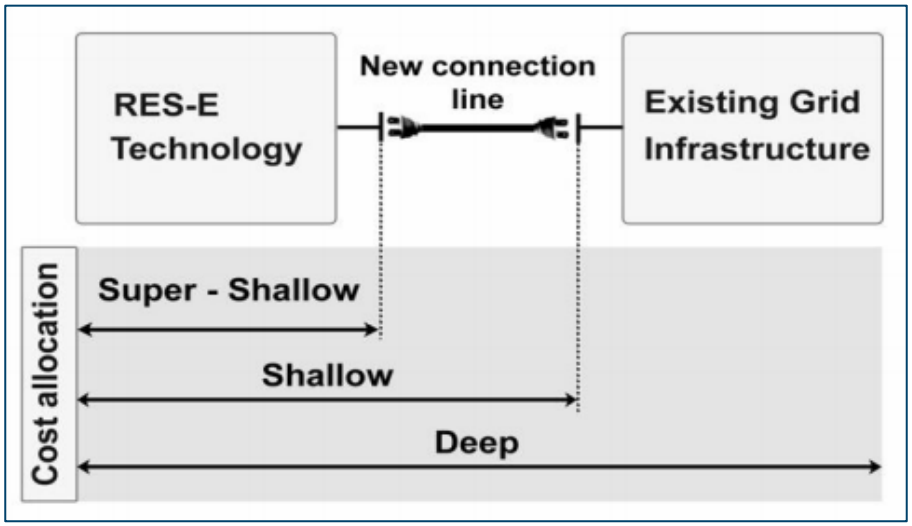
- Option 3 (using the cost benchmark of large-scale renewables) seems to be most appropriate for the Ukraine. Further research is required on how to determine this benchmark (e.g. the results of the first onshore wind pilot auction, the average value of several auction rounds or other approaches).
- The total costs for RE deployment need to be modelled, including estimates of GET FIT funding required.

3.3. Can grid expansion costs also be covered by GET FIT budget?

The transition of the Ukrainian electricity system would not only require significant additions of renewable energy capacity but also significant grid expansion. Some countries have opted to also finance grid connection or grid expansion costs via the GET FIT program.

The Ukraine follows the so-called deep connection charging approach, meaning that producer of renewable electricity has to pay both for grid connection and for grid reinforcement. This includes the costs for the connection line to the next connection point as well as the costs for reinforcing the already established grid infrastructure. The costs related to the upgrading of the existing grid infrastructure could be covered via GET FIT funding in terms of direct payment to the RE project developer.

Figure 5. cost-sharing frameworks for grid connection



Source: Auer et al. (2006)

Next Step and Further Research

- The grid expansion costs for different RE power generation technologies in the Ukraine need to be further investigated.
- Grid upgrade costs as a share of total project costs need to be determined.
- An assessment of the financial project viability needs to be executed to understand the effects of covering grid upgrade costs via GET FIT (number of projects that become financially viable).

3.4. How are payment flows organized with the GET FIT concept?

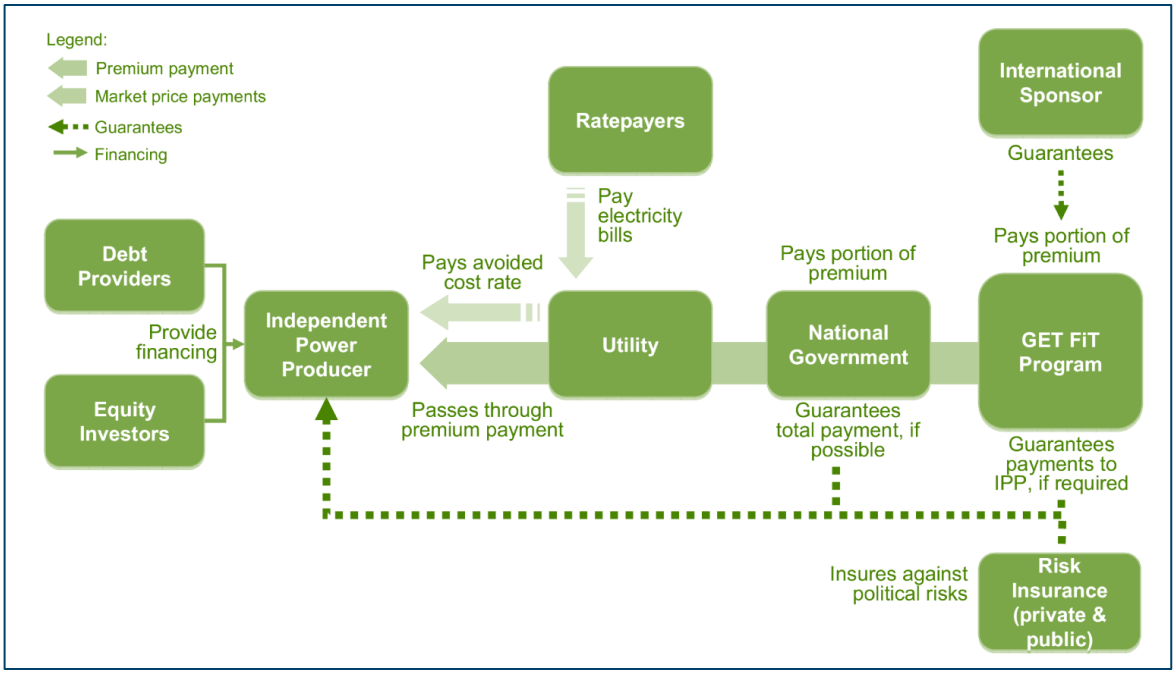
The basic concept for organizing payment flows with the GET FIT concept is simple. Renewable energy producers would receive payment from two sources:

- First, the general electricity system budget (like all other power producers).
- Second, GET FiT would provide premium payments (gap funding) to independent power producers in the Ukraine.

The GET FIT premium could either be paid directly to the renewable energy producers (via a trust account, see next section) or passed through the national utilities to independent power producers (IPPs). The transfer payments of the FiT premium to the IPP could be guaranteed by the national government, or by the GET FiT Program, depending on the national context and creditworthiness of the involved parties. An international sponsor would provide an ultimate guarantee for the GET FiT payments.

Currency risk is also a concern in the global renewable energy market. Therefore, the GET FiT portion of the payments could be made in hard currency, thereby significantly minimizing local currency risks. The basic payment flows of GET FIT are illustrated in Figure 6.

Figure 6. Payment flows under the original GET FIT concept



Source: (DB Climate Change Advisors 2010)

Next Step and Further Research

- A detailed assessment of the optimal payment flows within the existing Ukrainian framework is necessary.
- The creditworthiness of the key institutions potentially involved in the GET FIT program is required (impact on cost of capital for IPPs).
- Existing guarantees and other de-risking policies to reduce the cost of capital in the Ukraine need to be investigated.

3.5. How is the money managed transparently?

In the other countries that have implemented the GET FIT concept, the available money is managed by an international organization within a **trust account**. In the case of Uganda, for instance, the KfW bank established a GET FIT trust account. This way, it can be assured that the collected finance will be distributed on time and transparently to all RE projects. In the case of a trust account it needs to be assured that all donors that contribute to GET FIT have similar reporting requirements and obligations.

In the case that longer-term donor finance is made available (e.g. over the next 10-20 years), it might also make sense to establish a revolving fund as a separate legal entity.

Next Step and Further Research

- The funding sources for GET FIT Ukraine need to be further specified.
- The advantages and disadvantages of a Trust Account or a Revolving Fund need to be further detailed.

3.6. What are the positive impacts of GET FIT on electricity prices, subsidies and the development of distributed generation?

Financing certain cost related to the deployment of renewables via GET FIT can have positive impacts on electricity prices and subsidies. The GET FIT concept can **reduce electricity prices for final consumers** since not all costs of the electricity systems will be passed on to the final consumers. In turn, the **existing subsidies for low-income households can be reduced**, thus **freeing government finance** for other investments. It can also enable a balanced approach for supporting large-scale renewables via auctions and seemingly costlier small-scale RE projects and distributed generation via the feed-in tariff and GET FIT funding.

However, there are also disadvantages of establishing GET FIT. First and foremost, **renewable energy projects might appear to be expensive**, since they require an additional payment (gap funding). Therefore, it is important to communicate the rational for additional funding (e.g. the non-internalization of the negative external effects of coal-fired power generation in the Ukraine, the difficulty to quantify the positive effects of distributed generation in the Ukrainian electricity system, etc.).

3.7. What funding options are available for GET FIT in the Ukraine?

The GET FIT approach can serve two objectives:

a. First, aggregating and coordinating of existing technical assistance and funding.
b. Second, attracting new funding from donors and international climate finance

a. Aggregating and coordinating of existing technical assistance and funding

In the Ukraine, several donor organizations are supporting renewable energy deployment in the electricity sector.

- Nordic Environment Finance Corporation (NEFCO) provides grant financing to promote the cooperation in the fields of renewable energy and alternative types of energy sources in power and heat generation and in district heating networks via the "Finland Ukraine Trust Fund".[15]
- The European Bank for Reconstruction and Development (EBRD) has invested more than €200 million in renewable energy projects in the Ukraine and has financed nine renewable energy projects under UKEEP (credit line to commercial banks) with a total of €33 million.[16]
- EBRD has also set up the Ukraine Sustainable Energy Lending Facility (USELF) to deliver 200 GWh of renewable energy through an innovative combination of EBRD commercial financing, dedicated technical assistance support and concessional grant co-financing.[17]
- The Black Sea Trade and Development Bank (BSTDB) is providing loans for solar PV projects within the Ukraine.[18]

Next Step and Further Research

- A more detailed analysis of the existing donor landscape is necessary (IFC, etc.). Is additional funding provided via EU budget? Is additional donor finance provided by other EU countries?
- What are the requirements and pre-qualifications of the different funding sources?
- In addition, all donors need to be familiarized with the GET FIT concept.
- Donors need to be approached to see whether they want to channel some of their future contributions through the GET FIT fund.

[15] https://www.nefco.org/fund-mobilisation/funds-managed-by-nefco/finland-ukraine-trust-fund/
[16] https://www.ebrd.com/green-ebrd-investments-in-ukraine.html
[17] https://www.ebrd.com/news/2014/uself-boosts-ukraines-renewable-energy-sector.html
[18] https://www.ebrd.com/news/2018/ebrd-and-bstdb-support-renewables-in-ukraine.html

b. Attracting new funding from donors and international climate finance

The GET FIT concept is crucial for moving from project finance to program finance. By establishing the GET FIT concept, the Ukraine will adopt a transparent and scalable framework for supporting renewable energy deployment. Instead of supporting individual projects, the GET FIT fund will **support an entire renewable energy program**. This can be an attractive proposition to international donors who want to provide finance without having to develop individual projects and without having to establish a whole new finance framework.

The **Green Climate Fund (GCF)** is one option to acquire additional international funding for renewable energy projects. The Green Climate Fund offer project finance in terms of grants, concessional debt financing, equity and guarantees. Acknowledging that developing related finance proposals can be tedious and time consuming, the Green Climate Fund has established the Project Preparation Facility to provide financial support to applicants to prepare projects and programmes.[19]

Next Step and Further Research

- The GET FIT concept would need to be presented to potential future donors.
- Further research is required on how finance from the Green Climate Fund can be acquired an integrated into the GET FIT concept.
- Other funding options such as the Climate Investment Funds (CIFs) and the Global Environmental Facility (GEF) need to be further investigated.

[19] https://www.greenclimate.fund/gcf101#

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About the Energy Watch Group

Energy Watch Group (EWG) is an independent, non-profit, non-partisan global network of scientists and parliamentarians. EWG conducts research and publishes independent studies and analyses on global energy developments. The mission of the organization is to provide energy policy with objective information. Further information can be found here: www.energywatchgroup.org.

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Dr David Jacobs is managing director and founder of the consulting firm IET – International Energy Transition GmbH. Previously, he was lecturer for energy and climate related topics at Freie Universität Berlin and the University of Applied Sciences HTW (Berlin). In addition, he was acting project director of the Transdisciplinary Panel on Energy Change at the Institute of Advanced Sustainability Studies in Potsdam and director of renewable energy projects at the consulting firm IFOK. His research focuses on financing, policies and framework conditions for renewable energy sources. Mr. Jacobs has an academic background in Economics and Languages and a PhD in political science. He worked as a renewable energy policy consultant for many governments and international organizations. He authored more than 60 articles, reports, books and book chapters on sustainable energy policy design. He worked in a number of emerging economies and developing countries, including Azerbaijan, Ghana, Nigeria, Malaysia, Saudi Arabia, the Philippines, South Africa, Turkey, Tunisia and Taiwan. In addition, he presented on renewable energy framework design in more than 35 jurisdictions and gave advice to policymakers from more than 65 countries world-wide.