CENTER FOR THE STUDY OF DEMOCRACY

DECENTRALISATION AND DEMOCRATISATION OF THE BULGARIAN ELECTRICITY SECTOR: BRINGING THE COUNTRY CLOSER TO THE EU CLIMATE AND ENERGY CORE

Policy Brief No. 79, July 2018

Overview

The European Union's Energy Union[1,2] aims at a citizens-centred energy transition and targets to ease the delivery of the **EU's energy-climate objectives**:

- reduce EU territorial greenhouse gas emissions (by 20 % by 2020, and by 40 % by 2030);[3]
- increase the share of energy coming from renewable sources (to 20 % by 2020 and to 32 % by 2030); and
- improve energy efficiency (by 20 % by 2020, by 27 % by 2030).

The achievement of the 2030 goals is only part of the grander ambition of the EU to reduce CO_2 emis-

[1] In February, 2015, the EU laid out an ambitious strategy to set up an Energy Union, which will streamline all previous EU energy policies and will define the future path towards decarbonisation of the energy system, the complete integration of energy markets and the strengthening of energy supply security.

[2] COM/2015/080 final Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy.

[3] The EU is currently discussing a possible increase of its 2030 climate targets including a hike in the carbon emissions reduction from 40 % to 45 %. This would mean a new energy efficiency target of 32.5 % rather than the original 27 % and a renewable energy share in final energy consumption of 32 %, more than the 27 % originally pledged.

KEY POINTS

- The Bulgarian government should align carefully its policy priorities on energy and climate with its EU pledges to avoid the multibillion euro mistakes of the past.
- The first-generation renewable energy policy in Bulgaria was mismanaged to the benefit of a few politically well-connected companies and individuals unleashing a popular backlash against green energy.
- A low-hanging fruit to decarbonise the electricity sector would be the exploitation of Bulgaria's enormous potential for decentralised power generation through renewable energy sources. Decentralisation of power supply would empower households and contribute to the decline of energy poverty.
- Bulgaria has a long-term potential capacity for decentralized PV-based power generation of more than 5.4 TWh per year, one-seventh of the current power consumption in the country.
- A total of just 929 PV installations below 30 kW have been added to the distribution grid since 2006 with the majority of plants connected in the 2011 – 2013 period.
- Bulgaria has some of the most burdensome procedures among the EU countries, when it comes to the installation and exploitation of small PV facilities, particularly regarding grid access and system operation.
- Decentralisation would democratise and bring Bulgaria's energy and climate policies closer to the EU core. But it would require bold and complex policy-making, both at central and local government level, in the face of system inertia and the opposition of powerful incumbents.

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sions in the electricity sector by more than 90 % by 2050. The commitment to the EU targets puts **Bulgarian energy policy at a crossroad**. The Bulgarian government should choose and implement its energy strategy in careful alignment with its EU pledges or risk losing further billions of euros in costly projects.[4]

A scenario-building exercise using European Commission approved modelling techniques, part of the development of a South East Europe Regional Electricity Roadmap (SEERMAP)[5] for the almost complete decarbonisation of electricity generation in the region by 2050, provides an example of how Bulgaria should choose its priorities. Under SEERMAP scenarios Bulgaria would see a **significant replacement of fossil fuel generation capacity** whether or not the country's government pursues an active policy to support renewable electricity generation. **Rising carbon prices would drive the doubling of wholesale electricity prices by 2050**, and coal and lignite power plants would be phased out by mid-century accounting for less than 3 % of today's level. While the elimination of carbon-intensive power plants would be the product of market forces coupled with stricter environmental requirements in the EU, their replacement with renewable energy capacities on a mass scale would be dependent on the government policies of each member state.

With the ongoing phase-out of the first generation of state-support measures to developing renewables, **Bulgarian policy-makers have been late to define new ways to foster the decarbonisation** of the electricity system while maintaining security of supply. The existing support mechanisms were purposefully mismanaged to the benefit of a few well-connected companies and politicians.[6] The **bad governance of the first-generation renewable energy policy** did not bring about the democratisation of electricity generation as was hoped for. In fact, it has produced a popular social backlash fuelled by rising electricity prices and exacerbated by widespread energy poverty, which has rendered the case for renewables support politically toxic.

A low-hanging fruit would be the exploitation of **Bulgaria's enormous potential for decentralised generation of electricity** through renewable energy sources. The SEERMAP scenarios show that unlocking it would contribute to a national energy revolution, which in fact would be the cheapest and most fiscally neutral way to increase the share of renewables in the electricity system.[7] Decentralisation of power supply would empower households, democratise energy generation, and contribute to the decline of energy poverty as small-scale facilities could cover a large share of their consumption. The result would be an **alleviation of the socio-economic pain** exerted by the power market liberalisation, and the stabilisation of the electricity system, which suffers under the strain of unpredictable, extreme spikes in demand such as the 2017 winter power crisis that led to the collapse of power trading in the SEE region.

But decentralisiation and democratisation of the power supply **requires complex and disciplined policy development and implementation** and will continue to face system inertia and opposition from the incumbents. For example, the power supply decentralization would **strain district system operators** (DSOs), which would need to invest resources in modernising and upgrading the existing infrastructure to accommodate the large amounts of new distributed electricity supply, which would bite from their already thin profit margins.[8] Managing decentralization would require a **significant improvement of the administrative capacity of municipal governments**, which have been ill-prepared to process projects for the installation of small-scale renewable energy plants.

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4 For a detailed discussion on Bulgaria's energy governance deficits, see CSD (2014), Energy Sector Governance and Energy (In)Security in Bulgaria, Center for the Study of Democracy, Sofia.

5 Szabo, Laszlo et. al. SEERMAP: South East Europe Electricity Roadmap South East Europe Regional report 2017. September, 2017.

6 CSD (2011), Green Energy Governance at a Crossroads, Center for the Study of Democracy, Sofia.

7 Szabo, Laszlo et. al. Szabo, Laszlo et. al. SEERMAP: South East Europe Electricity Roadmap South East Europe Country Report: Bulgaria. September, 2017.2017. September, 2017.

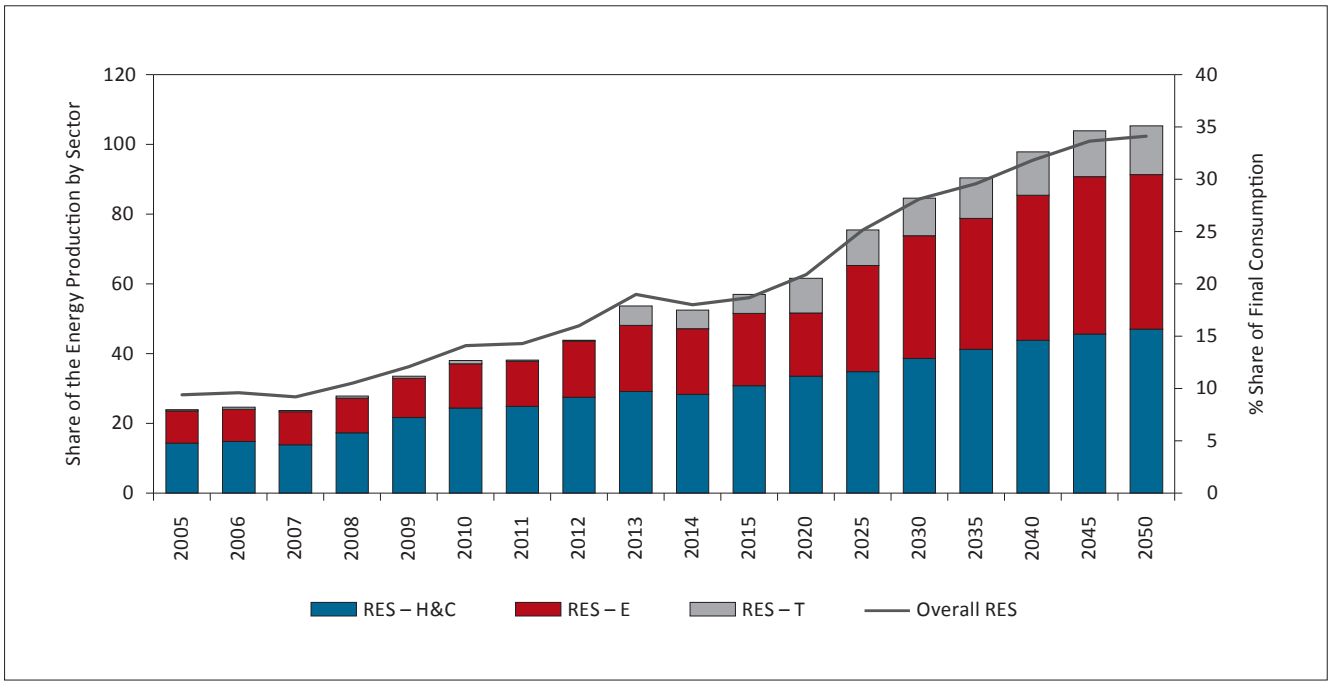
8 Some of the main policy conclusions in this policy brief are stemming from closed discussions and workshops with representatives of the key decentralisation stakeholders including the three DSOs in Bulgaria, the energy ministry, the Energy and Water Regulatory Commission (EWRC) and the Sustainable Energy Development Agency (SEDA) held in the first half of 2018.

Unlocking Bulgaria's Renewables Potential

Even if **most of Bulgaria's emissions are related to the energy sector**, still, energy policy efforts of the past decade have been focused on the preservation of lignite-fired power plants and the construction of a new nuclear power plant. Meanwhile, **RES integration has lagged** behind following the short-lived, and mismanaged, green energy investment peak of 2011 – 2012.[9] However, Bulgaria is on track to reach its renewable energy target for 2020.[10] In addition to the 3300 MW hydro power generation capacity and the almost 2000 MW of solar photovoltaic (PV) and wind facilities, the share of renewables in the electricity sector had risen to almost 19.2 % of the total almost equal to the RES-Electricity (RES-E) 2020 target of 21.3 %. Even before the 2009 – 2013 massive expansion of solar and wind capacity, close to one-quarter of the power generation capacity in the country was held by the hydro-power sector.

Almost 90 % of all new RES generation capacity was installed between 2010 and 2012 leading to sharp increase in final user tariffs in the middle of the economic recession. The Feed-in-Tariff (FiT) model adopted as the preferred option to foster renewable energy generation has been managed in such a way as to benefit large-scale renewable energy facilities, and hence **large investors and very often politically-connected players that have captured regulatory and licensing institutions** to receive construction permits and preferential connection to the grid.[12] This has allowed **the orchestrating of a popular backlash** against any RES development among the

Figure 1. Share of energy production from renewable energy sources by sector and in the final energy consumption (%)



Source: *National Statistical Institute; Projections from the PRIMES Model.*[11]

[9] Mantcheva, Denitza et. al. (2012). Green Growth and Sustainable Development for Bulgaria: Setting the Priorities. Center for the Study of Democracy and the Bulgarian office of the Friedrich Ebert Stiftung, February, 2012.

[10] The 2016 share of renewable energy sources in the gross final energy consumption stands at 18.8 %, well above the 16 % target undertaken by the country under EU agreements. Based on data from: https://www.statista.com/statistics/747958/share-renewable-energy-electricity-consumption-bulgaria/

[11] The PRIMES model is an EU energy system model which simulates energy consumption and the energy supply system. It is a partial equilibrium modelling system that simulates an energy market equilibrium in the European Union and each of its Member States. This includes consistent EU carbon price trajectories.

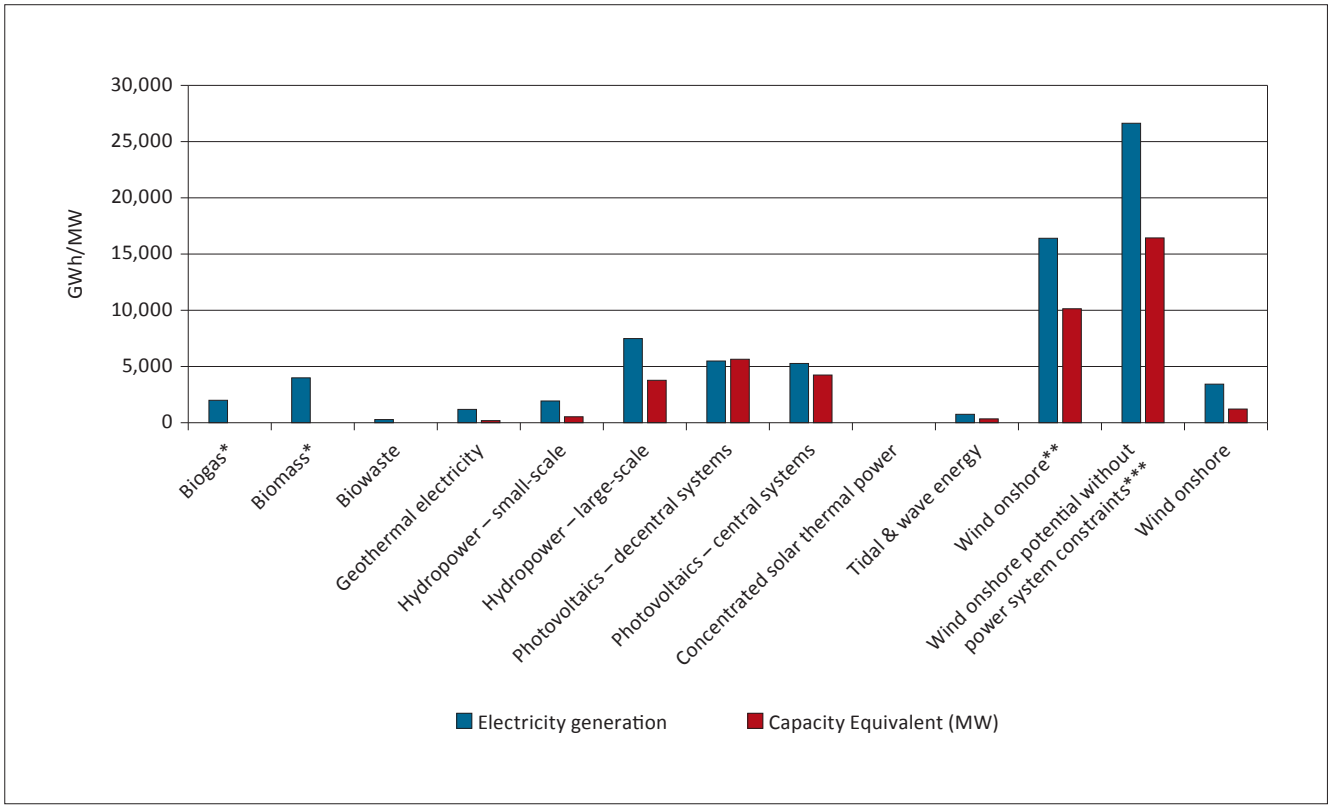
[12] CSD (2011), Energy and Good Governance in Bulgaria. Trends and Policy Options, Center for the Study of Democracy, Sofia.

general population. Following the ensuing political crisis, in 2012 – 2014 Bulgarian policy-makers suspended the FiT scheme and are yet to replace it with another model for RES state support. Meanwhile, **existing RES facilities were placed under substantial administrative and tax burden** and saw their generation potential curtailed by a production threshold imposed by the energy regulator.

Although state support in the form of preferential FiTs was preserved for **the smallest generation power plants of up to 30 kW**, they **remain a rarity**. A total of just 929 PV installations below 30 kW have been added to the distribution grid since 2006 with the majority of plants installed between 2011 and 2013. Since then, **the number of new installations has declined precipitously** to just 32 plants in 2017. The total generating capacity of small-scale RES (almost entirely roof-top or small-scale farmland PV installations) is 19,52 MW or barely 1.4 % of the total wind and solar capacity in the country. Predictably more than half of all installations are located in Southern Central and Southeastern regions of the country, where the solar potential is the highest. Bulgaria has a **long-term potential capacity for decentralized PV-based** power generation of more than 5.6 GW, which would produce up to 5.4 TWh per annum or **one-seventh of the current power consumption** in the country.[13]

The low uptake of small-scale renewable energy installations is not surprising considering that **Bulgar-**

Figure 2. Long-term (2050) realizable potential for RES-electricity technology



* *for biomass and biogas the expressed electricity generation potential serves only as a rough indication, reflecting rule-of-thumb pre-allocation to different uses (heat, electricity, transport) of the underlying potential for bioenergy feedstock.*

** *potential used in Green-X modelling, based on GIS modelling with consideration of technical (power system) constraints and of land use limitations.*

*** *potential based on GIS modelling without consideration of technical (power system) constraints but with land use limitations.*

Source: *Green-X model for the South East Europe Electricity Roadmap (SEERMAP).*

[13] According to the adapted version of the Green-X model of the future development of the main renewable energy technologies, created by the Technical University of Vienna. The results are based on the theoretical solar potential in the country, which is expressed in about 2,150 annual solar hours and 1,517 kWh/m^2 of average annual solar radiation, and the technological change and diffusion expectations for PVs.

ia has some of the most burdensome procedures among the EU countries, when it comes to the installation and exploitation of PV facilities, particularly regarding grid access and system operation. The incentives such as the FiTs are not sufficient to compensate for the **limited funding for small PV** projects and lack of financing mechanisms, such as grants and preferential loans for green energy. Small investors have also been deterred by the **unpredictability of policies and incentives**. Characterized by high upfront costs (but low operational costs) and a relatively long payback period (8-9 years), small PV capacities need a more predictable environment to thrive. Bulgaria's support scheme for new capacities under 30 kW in the upcoming decade is unclear yet as some of the key strategic documents such as the National Energy and Climate Plan (NECP) would not come out publicly before the beginning of 2020.

Administrative Bottlenecks to Decentralisation

The lack of a differential approach towards the integration of small-scale RES in Bulgaria, means that relatively the **administrative burden for households and small businesses is much greater** than for an energy company investing in a large-scale capacity. Even if a household wishes to install a renewable facility only for self-consumption, the requirements are similar to the one faced by industrial-scale producers. The introduction of a fast-track procedure for small-scale RES, or even a one stop-shop institution speeding up the overcoming of administrative hurdles by prosumers is critical if the country would take advantage of its enormous potential for decentralised power generation.

The construction of small rooftop PV systems on residential buildings in Bulgaria is hampered by **numerous complicated procedures**. It involves time-consuming consultation procedures with the municipality and the district system operator (DSO). The procedures entail the need for a supervision company to monitor the construction, as well as complimentary architectural, electrical, static and other designs subject to special approval by the municipal administration. The 2011 changes to Land Use Planning Act (LUPA) and the 2012 amendment to the Energy from Renewable Sources Act (ERSA) have eased the administrative burden by eliminating the need for a building permit and streamlining the grid connection process for facilities below 30 kW. But these have not been implemented properly by all municipalities. Connecting a small-scale PV installation still takes at least 20 weeks in the best-case scenario and could take up more than half of the total investment costs. A comparative analysis of the administrative barriers in the most successful cases of decentralisation such as the UK, Germany and the Netherlands, shows that it takes less than 10 weeks to complete the administrative process with administrative costs not exceeding 15 % of the total investment. **Permitting deadlines are not always kept** in Bulgarian municipalities due to lack of administrative capacity but also **often as a result of corruption** and ineffective legal procedures. Moreover, many urban areas do not have an approved street regulation as part of the Detailed Site Development Plan (DSDP), which makes it difficult to locate residential and electrical infrastructure that needs to be upgraded to allow the installation of the renewable capacity.

One of the biggest obstacles to the development of new small-scale installations is **the ability of DSOs to de-facto reject connection to the grid** if a) there is no technical availability to connect the producer in the requested timeframe, or b) when the connection of this producer would lead to the deterioration of the supplies for other consumers due to lack of [grid] capacities. This contradicts the preferential status for connecting residential installations provided by the ERSA legislation itself. DSOs also routinely transfer the connection costs related to the modernisation or expansion of the distribution infrastructure to the investor although under ERSA DSOs are responsible for covering them in full until the point of connection at the facility's property.

The cumbersome procedure for the construction of a small-scale RES installation, is followed by an equally **complicated process for exploiting the facility and trading with the DSOs**. Firstly, the prosuming household or business needs to pay for the installation of a smart metering device, which sends power generation data in real time to the DSO. The prosumer has to then enter in an agreement with a special balancing group (SBG). The SBG plays the role of balancing the differences between generated and consumed electricity according to a generation timetable approved in the agreement. The timetable is submitted by the prosuming entity in advance for a period of one year. In case of an imbalance (no matter whether above or below the forecast), the prosumer pays a small penalty of up to several euros. Estimating gen-

eration and sales to the grid with exact precision is almost impossible especially if the main purpose of the generating facility is self-consumption. Once the renewable facility is connected to the grid, the owner has to apply to the Sustainable Energy Development Agency (SEDA) to be granted a new guarantee of origin (GoI) certificate every time the facility generates over 1 MWh. This is again a slow administrative procedure, which requires the sending of a number of documents including invoices for the sold electricity, geospatial information for the facility including a detailed, certified design scheme, a trade measurement protocol and a certified copy for the exploitation of the facility.

On top of the administrative and balancing costs of servicing a small-scale renewable-energy facility, a 5 % revenue tax is levied on all producers of electricity, which is paid monthly to the Energy Sustainability Fund (ESF). The revenue tax, which was introduced in 2015 in attempt to close the tariff deficit in the wholesale regulated market supplier, includes also the payment of a 10 % corporate tax. Paradoxically, if accumulated, **all the taxes and administrative fees paid by prosumers for the registration, installation and exploitation of a micro-scale energy facility could potentially exceed the net income** (after subtracting the electricity for self-consumption) from selling power back to the DSO. And this does not include the initial investment in building the facility and the time spent in an administrative procedures.

Limited Investment Incentives for Renewables

There are **no measures to encourage the creation of energy communities** at municipal level or other schemes to encourage inclusive market development. The renewable energy act is often changing without much public discussion or anticipatory measures to consult with investors. The arbitrary introduction of fees in the past such as the access fee or the current 5 % revenue tax have diminished the ability of prosumers to establish their project financing structure and calculate accurately an expected rate of return.[14]

DSOs also face disincentives to add new decentralised power generation capacity. First, they may have to invest in their own grid or in installing smart meters across the board to accommodate smaller RES. However, the needed investments may not be approved by the energy regulator due to its insistence on preserving final power prices low. Second, if the small RES producer is "behind the meter", this would mean lower sales for the incumbent supplier and lower revenues for the DSO, which would also have a detrimental effect on prices for other consumers. Eventually, the DSOs may fall into a "Utility Death Spiral", when the "defection" of one user from the grid leads to higher prices for the remaining consumers and thus incentivizes them to "defect" as well.[15]

For rooftop PV investors, **the default option is to use the facility as a behind-the-meter source of diminishing their own consumption**, while selling the excess generation of electricity back to the grid. Some households and businesses prefer the "self-consumption" option as it is "invisible" for the electricity distribution company making the administrative procedure for connecting to the grid less cumbersome. Even if investors would like to trade with final supplier, this remains very difficult. The Bulgarian legislation does not include specific net metering rules, which allows network operators to impose arbitrary administrative requirements for small-scale facilities. According to the energy law, investors could use electricity storage systems if they are in the immediate vicinity of the generation facility.[16]

Another serious factor affecting the business case for small rooftop solar or other distributed RES gen-

[14] CSD (2017). A Roadmap for the Development of the Bulgarian Electricity Sector within the EU Until 2050: Focus on Fundamentals. Policy Brief No. 70, October, 2017.

[15] Rocky Mountain Institute, Homer Energy and Cohnreznick Think Energy (2014). The Economics of Grid Defection: When and Where Distributed Solar Generation Plus Storage Competes with Traditional Utility Service.

[16] The specific legislation that needs to be changed in order to allow for net metering options is Ordinance 6 on Connecting Electricity Producers and Consumers to the Electricity Transmission and Distribution Grids. In order for net metering to be successful, the option for self-production of energy should be more lucrative than the consumption from the regulated market, where prices are still below the full costs of the service. Ministry of Energy (2014) Ordinance 6 on Connecting Electricity Producers and Consumers to the Electricity Transmission and Distribution Grids (Naredba 6).

eration is the **widespread energy poverty** in Bulgaria. Close to 40 % of households face difficulties in paying their electricity bills, which has made it politically impossible for the government to accept an increase of power prices by the regulator. The power tariffs hike of 2012 have been used to instigate mass street protests in early 2013 leading to the toppling of the cabinet. EU data shows that household retail electricity prices (including all taxes) in Bulgaria are the lowest in the European Union and about 2.5 to 3 times less than prices in the most expensive markets (e.g. Germany, Denmark, and Belgium) although at purchasing power standard (PPS) they are almost equal to the EU average. Thus prices still distort consumer energy choices especially for middle and high-income households, who are more likely to invest in off-the-grid solutions. Meanwhile, **subsidies for energy poor households are not targeting a transformation of consumption patterns**, i.e. incentivising energy efficiency or investment in self-sufficiency but represent cash transfers to cover directly utility bills or even worse the purchase of air-polluting coal and wood. In addition, the general macroeconomic framework in Bulgaria does not provide an enabling environment for energy investments. The weighted average cost of capital (WACC) is higher than in other countries due to the political risk, the lack of regulatory consistency and the small size of the market. Local banks are also more conservative than their peers in other EU countries.

The Bulgarian government has embarked on a World Bank mandated[17] program for the full liberalisation of the power market, in which the regulated market is gradually phased out. In addition, within the next five years only the most vulnerable households would receive a "social" tariff, while subsidies for the rest would be gradually eliminated. With the increase of power prices, households would have a bigger incentive to see alternative options to satisfy their electricity consumption. Delivering this transition without serious social backlash would be yet another important step in **bringing Bulgaria closer to the EU's core in terms of energy and climate** policies.

Policy Recommendations

The development of small RES in Bulgaria may be improved, if the following policy recommendations are considered:

- Design a concrete action plan for jumpstarting investments in small-scale renewable energy plants that includes a piloting phase for a new support scheme in several municipalities to be followed up by a nation-wide program borrowing from the experience of energy efficiency investment initiatives.
- Amend the legislation in order to allow and promote installation of small RES at end consumers' locations through one-stop shops at municipalities and diminished administrative burden;
- Reduce to a minimum the number of administrative steps that are related to permitting procedures in order to decrease unfounded delays and grid connection denials;
- Change the regulatory cost model for the distribution grids so that the prices for access to the grid are not dependent on the quantity consumed;
- Reconsider large-scale, government-sponsored energy projects and transparently compare the expected costs for the final consumers with the costs of electricity produced from small RES;
- Simplify the procedures for introducing net-metering possibilities for small-scale RES and prevent DSOs from arbitrary changing the administrative procedures for trading excess electricity with the grid;
- Introduce new guidelines in the renewable energy act that would outline the steps for setting up an energy cooperative.
- Change the focus of the RES policies from electricity-only to heating and cooling as well – with the proper incentives for end users to consider such option;
- Increase the regulatory monitoring and control toward DSOs to allow for less rejections of small RES connections;
- Ensure the inclusion of all RES in a transparent, non-discriminatory national electricity market;
- Prioritize energy poverty in the policy frameworks of the energy and environment ministries, in close cooperation with the social policy ministry;

[17] World Bank (2016). Bulgaria Power Sector: Making the Transition to Financial Recovery and Market Liberalization. Summary Report. November, 2016, accessed at https://www.me.government.bg/files/useruploads/files/wb_ras_i__summary_report_en.pdf

- Support new renewable energy capacity not through market-distorting preferential feed-in tariffs but through special financing vehicles for co-funding projects and providing subsidies for low-income groups;
- Include municipalities as active partners in public-private initiatives for the development of renewable energy cooperatives to increase energy self-sufficiency of small communities;
- Engage citizens and the key local stakeholders in extended dialogue on the opportunities and benefits of decentralised production and drive towards a prosumer society.