

Energy transition in Bulgaria

Final Report

NECP analysis, implications and
conclusions for Bulgaria

10.12.2019



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Introduction

Study background



- ▲ In 2018, Baringa undertook an independent review of the Bulgarian gas market.* Based on qualitative analysis, we formulated a number of recommendations with regards to the **opportunity for natural gas** to support Bulgaria's progress towards a decarbonised energy future. One of the areas of opportunity identified was for an **accelerated transition from coal to natural gas in power generation**.
- ▲ In a 2019 study, co-funded by Shell and performed in consultation with EBRD,** Baringa found that there are **societal benefits of €2.4bn** associated with an **accelerated transition from coal to gas**. Our study also highlighted that significant support would be required to deliver a fair and just transition.
- ▲ Baringa participated in extensive engagement with senior stakeholders in the Bulgarian energy sector. **They agreed that a transition strategy is needed and should be debated within the Bulgarian energy industry.**
- ▲ Increases in carbon prices and the application of stricter rules regarding industrial emissions are increasing the urgency of defining a plan for an energy transition in Bulgaria.
- ▲ The EU-wide requirement to submit **National Energy and Climate Plans** ('NECPs') by end of 2019 provides the opportunity to set out a roadmap for Bulgaria's energy transition.
- ▲ In this context, **the Deputy Minister of Energy has invited energy stakeholders to provide input into Bulgaria's final NECP.**
- ▲ Shell has engaged Baringa to provide an overview of energy transition measures proposed by other EU countries with coal in their energy mix, broadly categorised as follows:
 - a group of **'peer' EU countries**, currently reliant on coal for their power generation, with socio-economic and geographic characteristics broadly comparable to those in Bulgaria.
 - a group of **benchmark EU countries** which have defined clear plans for the phase-out of coal.
- ▲ By providing a view of the range of transition measures adopted by countries currently reliant on coal, this analysis seeks to assist the Ministry of Energy in addressing key EU comments on Bulgaria's draft NECP and inform the country's Energy Strategy for 2020-2030. Whilst we focus on the opportunity for natural gas to support Bulgaria's progress towards a decarbonised energy future, we also review the rest of the energy mix to enable a complete debate.

* <https://www.baringa.com/en/insights-news/points-of-view/bulgaria-role-of-gas-in-decarbonisation/>

** <https://www.baringa.com/en/insights-news/news/energy-transition-in-bulgaria-from-coal-to-gas/>. We modelled the impact of 1.4GW of coal being replaced by gas in the mid-2020s instead of the mid-2030s.

Introduction

Context – The drafting of NECPs across Europe

- ▲ As part of its Energy, Climate Change and Environment policy, the EU has implemented a number of Climate Frameworks and targets.
- ▲ The **2030 Climate and Energy Framework** was agreed by the European Council in 2014 and defined targets to 2030:
 - Reducing greenhouse gas ('GHG') emissions by 40%.
 - Producing 32% of energy from renewables.
 - Improving energy efficiency by 32.5%.
- ▲ The 2015 Paris Agreement provided further momentum to the definition of ambitious global climate policies, as 195 countries agreed to limit global warming to well below 2 degrees Celsius.
- ▲ The 2030 Climate and Energy Framework also required Member States to adopt integrated **National Energy and Climate Plans** (NECPs), defining national targets and measures that will enable Member States to achieve the EU-wide 2030 targets across five energy dimensions. Member States submitted their draft plans towards the end of 2018 or early 2019 for delayed submissions.
- ▲ The European Commission has provided feedback on all draft NECPs, and final NECPs are due to be submitted by end of 2019.



Introduction

Context – European Commission’s feedback on Bulgarian NECP

Legend: Priority areas
Other areas

EC’s Feedback on NECP pillars

Decarbonisation		<ul style="list-style-type: none"> ▲ Assess the interaction between the planned continuation of coal for power generation, from a cost and competitiveness angle, with an enhanced use of gas. ▲ Increase the renewables target to at least 27% ▲ Increase the level of ambition in heating and cooling and propose measures to meet the transport target
Energy efficiency		<ul style="list-style-type: none"> ▲ Increase ambition towards reducing primary and final energy consumption ▲ Propose corresponding measures and policies underpinned by an impact assessment
Security of supply		<ul style="list-style-type: none"> ▲ Specify a robust gas diversification strategy, including specific infrastructure projects and their contribution ▲ Define a strategy for the long-term supply of nuclear material
Market integration		<ul style="list-style-type: none"> ▲ Define objectives and targets concerning market integration ▲ Develop competition in the wholesale and retail market
Research, innovation		<ul style="list-style-type: none"> ▲ Clarify objectives and funding targets to support the implementation of the plan ▲ Underpin targets with policy measures and increased cooperation with Member States

Further comments

Regional cooperation		<ul style="list-style-type: none"> ▲ Intensify cooperation with neighbouring Member States and within existing frameworks
Investment plan		<ul style="list-style-type: none"> ▲ Provide an overview of the investments needed for the transition ▲ Assess the sources of funding for these investments
Energy subsidies		<ul style="list-style-type: none"> ▲ List all fossil-fuel subsidies ▲ List actions to phase-out fossil fuel subsidies
Air quality		<ul style="list-style-type: none"> ▲ Present and quantify impacts on air pollution of proposed measures
Managing the transition		<ul style="list-style-type: none"> ▲ Better integrate just and fair transition aspects, especially for coal ▲ Develop the approach to addressing energy poverty

The timing of our review of draft NECPs is such that key lessons from other countries with an energy system broadly similar to Bulgaria’s may be drawn and used to inform Bulgaria’s final NECP submission. The EC’s comments relating to the respective role of coal and gas for decarbonisation have directed the focus of our study towards this topic, but we also highlight other useful considerations for Bulgaria.

Country overview – Peer countries

High-level presentation of peer-country NECPs, by country

Country overview – Introduction

- ▲ In this Section, we provide a country overview of the draft NECPs published by peer-countries (Czechia, Greece, Hungary, Poland, Romania, Slovenia, Spain), and Bulgaria. These countries were chosen as peers for Bulgaria due to:
 - The importance of coal in their energy mix; and/or
 - Similarities in terms of socio-economic characteristics; and/or
 - Their geographical proximity to Bulgaria.
- ▲ For each peer country, we highlight the key evolutions and ambitions defined in their NECP, with a focus on power generation and the respective role of coal and gas.
- ▲ We also list examples of measures underpinning these ambitions, such as funding schemes, network investments and incentives to support the role of gas in the energy transition.
- ▲ The format of the review is as follows:



Country

<ul style="list-style-type: none">▲ High-level ambitions set out in the NECP.
<ul style="list-style-type: none">➤ Example <i>measures</i> to support the plan.

- ▲ Further details on each country's current energy mix and NECPs are available in Appendix 1.

Country overview – Peer-countries (1 of 4)



Bulgaria

- ▲ Bulgaria's NECP proposes a continued reliance on endogenous coal for power generation, to ensure security of supply. Bulgaria's NECP does not highlight a major role for natural gas in achieving emission reductions to 2030.
 - ▲ Delays in nuclear commissioning would result in a higher role for gas to achieve decarbonisation and security of supply.
 - ▲ Significant measures are proposed for the decarbonisation and improvement of energy efficiency in the heating sector, which is still a significant source of air pollution.
- *Bulgaria identified that the potential for high-efficiency cogeneration may be realised through the conversion of existing installations to high-efficiency cogeneration with natural gas turbines. Incentives are also available to support the development of renewable gas for heating and cooling, as well as gasification of residential heating.*
- *Bulgaria is planning significant upgrades to its national gas distribution networks and several interconnection projects are underway. Bulgaria aims to become a regional gas hub.*



Czechia

- ▲ The role of coal declines substantially over the period covered by the NECP, with a target of 11-21% of power generation by 2040 (from 50%) and a target of 11-17% in the overall energy mix (from 40%). Since the publication of the NECP, Czechia has created a Coal Commission, due to formulate recommendations for the organised phase-out of coal by September 2020.
 - ▲ Nuclear is expected to play a major role in replacing coal, but may be delayed to 2035-2040.
 - ▲ Natural gas is expected to be part of the solution, with a target of 5-15% of power generation (from 8%) and 18-25% of total energy mix (from 16%) by 2040. The role of gas might be even greater with an accelerated coal phase-out, with nuclear delays and/or if planned demand reductions are not realised.
- *Improved gas connections are proposed to increase the use of gas by large energy users.*
- *Czechia increases support for the use of renewable gases, for example in transport, and is adapting its gas networks for a higher share of biogas.*
- *EU ETS revenues are used to fund grants for the adoption of gas boilers.*

Country overview – Peer-countries (2 of 4)



Greece

- ▲ Since the publication of its draft NECP, which planned a smaller role for lignite by 2030, Greece has announced the **phase-out of coal by 2028**.
- ▲ The draft NECP already highlighted the role of natural gas in facilitating this shift in the power generation mix. With a full phase-out, it is likely that natural gas will have an even greater role in the energy mix.
- ▲ Greece has adopted a highly ambitious renewable electricity target of 55%.
- ▲ Greece is also targeting an increased usage of biogas in district heating and for transport through the creation of appropriate frameworks, investment aid and the development of networks.

- *Greece is increasing its financial support for gas CHPs.*
- *A fund of at least €60m is earmarked for the energy transition in areas impacted by the decline of coal.*
- *Infrastructure projects include upgrades to / new gas networks, gas storage facilities and LNG terminals.*



Hungary

- ▲ **Hungary intends to phase out coal in large-scale power generation by 2030.**
- ▲ New nuclear plants will have a substantial role in the future power generation mix, with the planned construction of two new nuclear units.
- ▲ Natural gas is expected to maintain its importance to 2030. The role of gas could be greater if new nuclear plants are delayed or cancelled, or if additional flexibility is needed.

- *A range of gas interconnection projects – with Poland, Slovakia, Czechia and Slovenia – are proposed to improve the security of gas supply.*
- *Hungary has signed an agreement with Russia for the commissioning of two 1,200MW nuclear reactors.*

Country overview – Peer-countries (3 of 4)



Poland

- ▲ In its draft NECP, Poland expects coal to continue playing a significant role for power generation in the medium term. This may be explained as 75% of electricity is currently generated from coal. In a recent publication, Poland suggests that additional funds need to be made available in the EU to finance the energy transition and allocated where modernisation needs are the largest. This may indicate a small shift in Poland's position.
 - ▲ Poland plans a degree of renewables deployment, with a target of 21% of total energy demand and 27% of power generation. The EC suggests that Poland may be required to adopt higher renewables targets.
 - ▲ Poland's NECP highlights the role of gas in providing flexibility, complementing inflexible coal and intermittent renewables. The role of gas may increase in case of nuclear delays and to support renewables deployment.
- *Support will be provided for CNG/LNG refuelling infrastructure to reduce transport emissions.*
 - *Substantial investment in gas infrastructure is planned, including interconnection, regasification, storage and internal pipelines.*
 - *Poland has adopted a national regulation limiting single source dependency for gas to 33% by 2023.*



Romania

- ▲ While Romania's NECP includes little explicit guidance on the future power generation mix, it suggests a reduction in the use of coal and a slight increase in the role of gas. Broadly speaking, the Romanian NECP seeks to achieve a diversified and flexible power generation mix.
 - ▲ Delays to new nuclear at Cernavoda could result in an increased role for gas to achieve decarbonisation and security of supply.
 - ▲ Romania has a target of 39.6% of total electricity being produced by renewables. The role of gas in providing flexibility for renewables integration is highlighted.
- *A support mechanism for high-efficiency cogeneration will be introduced.*
 - *Financial support will be provided for exploration and for the recovery of indigenous oil and gas.*
 - *Planned gas infrastructure projects include investment in national networks and interconnection.*

Country overview – Peer-countries (4 of 4)



Slovenia

- ▲ Overall, Slovenia's NECP lacks in detail. In particular, the NECP does not specify detailed plans regarding the country's reliance on coal-fired power generation.
- ▲ A substantial increase in renewables, to almost 50% of power generation, could increase the need for flexibility, benefiting natural gas.
- ▲ A number of measures are taken for the decarbonisation of the transport sector.

- *Support is proposed for new high-efficiency cogeneration.*
- *Subsidies for new CNG and LNG filling infrastructure are proposed to help reduce emissions from transport.*
- *Natural gas infrastructure is proposed to improve security of supply, e.g. through interconnection with Croatia and Hungary.*



Spain

- ▲ **Spain's NECP expects coal to be phased out before 2030**, and a Framework Agreement for the transition has been agreed for the coal sector.
- ▲ Natural gas is expected to maintain a role in the power generation mix through the transition (27GW of installed CCGT and 3GW of gas CHP in 2030, accounting for ~15% of total generation).
- ▲ A renewable electricity target of 74% is highly ambitious.
- ▲ Missing this target might imply a greater role for natural gas.

- *1,200 MW of new high-efficiency cogeneration capacity is proposed by 2030.*
- *Spain also proposes support for new renewable gases.*
- *Spain plans to maximise the use of its existing gas infrastructure to become a hub for natural gas, renewable gas and hydrogen.*

Summary – Focus on the power sector

Peer countries have set out detailed plans and/or ambitions to reduce coal in the medium-term. Bulgaria and Poland are the only two countries that see a material role for coal in power generation for the foreseeable future.

<h2>Coal</h2>	<ul style="list-style-type: none"> ▲ Hungary and Spain are targeting a phase-out of coal-fired generation by 2030, and Greece recently announced its plan to phase out coal by 2028. Czechia indicated the ambition to reduce coal to 11-21% of power generation by 2040, and created a Coal Commission in 2019. Other NECPs are lacking detail regarding future generation mix but imply that coal generation is likely to reduce in the future. ▲ The decline is driven by policy and by increases in carbon prices to above €45/tCO₂* by 2030, which reduce the competitiveness of coal relative to other technologies, including gas. Bulgaria’s continued reliance of coal is an exception, and has been challenged with respect to its decarbonisation targets by the EC.
<h2>Renewables</h2>	<ul style="list-style-type: none"> ▲ The EU’s 2030 climate and energy framework sets a target of a 32% share for renewable energy across the EU by 2030. As a result renewable energy has an increasing role in the energy mix of all the countries reviewed. ▲ Spain, Greece and Slovenia have ambitious renewables targets in the electricity sector, with respectively 74%, 55% and 47.4% of electricity produced from renewable sources by 2030. ▲ Bulgaria’s renewable target of 25% of energy (17% of electricity) is 2% lower than suggested by the EU.
<h2>Nuclear</h2>	<ul style="list-style-type: none"> ▲ Many of Bulgaria’s peers also have nuclear in their energy mix. Hungary, Czechia, and Romania all have plans to expand the role of nuclear, although any individual project could be delayed or cancelled. Poland also has plans to introduce nuclear, although this capacity will only be operational in the 2030s. ▲ Bulgaria extended the life of the Kozloduy plant (units 5 and 6) to 2027 and 2029 respectively. There are plans to restart the nuclear project at Belene, with ongoing investor selection and project licensing.
<h2>Natural gas</h2>	<ul style="list-style-type: none"> ▲ A role for gas in the energy transition is identified in the NECPs of most peer countries. Natural gas is seen as a transition fuel and as an essential source of flexibility. The role of gas will be even greater if there are nuclear construction delays or if countries fail to deliver their renewables targets. ▲ Many NECPs also highlight the role gas and renewable gases can play in transport and other sectors. A wide range of gas infrastructure projects are proposed across the region to underpin this role. ▲ Gas is currently underplayed as a component of the energy mix for decarbonisation in Bulgaria.



Key implications of peer-country NECPs

Overview of relevant measures and lessons for Bulgaria

Key implications – Introduction

NECPs demonstrate the range of measures taken by countries broadly comparable to Bulgaria and that may be transferred into Bulgarian energy policy



Fuel transition in power, industry, transport and heating

EC's feedback suggest that Bulgaria's decarbonisation measures may include a degree of coal-to-gas switching. Baringa's analysis found that an accelerated conversion to gas for power would bring societal benefits of €2.4bn and would save 46 million tonnes of CO2 emissions.*

Reducing the reliance on coal is a key measure for decarbonisation in most NECPs, with a full phase-out of coal by Hungary, Greece (expected) and Spain.

In power, **renewables** auctions are implemented, while support is available for **gas**, **CHPs** and/or new **nuclear**.

Across other sectors, significant measures are taken to encourage **fuel switching towards gas and/or biogas**, with the development of required infrastructure, the introduction of incentives and of an appropriate regulatory framework.



Role of gas in regional integration and competitiveness

EC's feedback highlights that market integration objectives need to be defined, and that competition needs to increase in the wholesale and retail markets.

Peer countries are implementing measures that improve **wholesale gas market functioning** to enable adequate price formation, competition and high market liquidity. Funding is allocated to facilitate the **development and deployment of innovative technologies** relating to gas.



Development of infrastructure

The EC asked Bulgaria to set out a plan of investments required for the transition, including gas infrastructure projects.

Peer countries are undertaking upgrades and expansion of national gas **distribution and transmission networks**, developing new gas **interconnection**, new **LNG** terminals and new gas **storage** infrastructure.



Security of gas supply

The EC advised Bulgaria to specify a robust gas diversification strategy to maintain security of supply throughout the transition.

Peer countries establish a security of supply strategy including new **interconnection**, mandatory gas **reserves** and the sourcing of gas from **varied suppliers**. Countries with endogenous resources also encourage **production and maximise recovery**.



Financing the transition

The EC suggested that Bulgaria will need to identify funding sources for transition investments, and that Bulgaria needs to integrate just and fair transition aspects in relation to coal.

Peer countries are taking a **proactive approach to financing the transition** by introducing transition plans including funding, or making use of various funds available through the EU.

* <https://www.baringa.com/en/insights-news/news/energy-transition-in-bulgaria-from-coal-to-gas/>

Key implications from peer-country NECPs



Many NECPs highlight the role of natural gas in the future power generation mix

Relevant measure	Countries	Considerations for Bulgaria
Electricity generation		
 <p>Coal – A degree of coal phase-out is a priority in many of the NECPs reviewed.</p> <ul style="list-style-type: none"> Improved plant efficiency – <i>Replacement of old units by higher efficiency units</i> Significant decline of coal in power generation – <i>Coal-to-gas switching target, reduction of subsidies, reduced dispatch due to increases in EU ETS price</i> Coal phase-out in electricity generation – <i>Significant closures expected due to increases in EU ETS prices and due to the EU Industrial Emissions Directive, phase-out of coal for power generation by a given date</i> 	<p>Poland</p> <p>Czechia, Greece, Slovenia</p> <p>(Greece), Hungary, Spain</p>	<p>Coal – Phasing out coal is a priority in many of the NECPs reviewed (including key markets in Bulgaria’s vicinity such as Greece and Hungary), and naturally follows from policies which reduce its attractiveness as a fuel, including the EU Industrial Emissions Directive and the higher EU ETS prices. Bulgaria’s NECP stands out compared to peer countries in stating that it will maximise the use of its domestic coal reserves.</p>
 <p>Gas – A role for gas in the energy transition is identified in most NECPs.</p> <ul style="list-style-type: none"> Improve plant efficiency – <i>Refurbishment of existing gas plants</i> Increased reliance on gas due to flexibility, dispatchability and lower emissions relative to coal (existing or new CCGT) – <i>Coal to-gas switching target, creation of replacement schemes to commission new gas plants, capacity markets</i> Increased reliance on CHP plants – <i>Increases in support available, introduction of new support mechanisms for CHPs, construction of new CHP capacity</i> Gas identified as a way to complement renewables – <i>Support for gas to provide complementary reserve to renewables</i> 	<p>Romania</p> <p>Czechia, Greece, Spain, Romania, Poland</p> <p>Greece, Poland, Romania, Slovenia</p> <p>Poland, Romania</p>	<p>Gas – The EC’s feedback highlights the advantages of gas in terms of cost and competitiveness compared to coal. Gas is seen as a transition fuel, being affordable and cleaner than other fossil fuel alternatives, in an EU-wide context of strict emissions reduction targets. Gas may be pivotal in ensuring security of supply as coal is phased-out and as new nuclear may be delayed. New capacity may be supported by capacity markets (planned for Bulgaria by 2020) and other measures.</p> <p>Natural gas also provides flexibility services that cannot be provided by other clean generation technologies such as nuclear and renewables. It is an enabler of renewables deployment and a fuel that may be used as part of fuel switching for the generation of power and/or heat.*</p> <p>Baringa’s analysis found that an accelerated conversion from coal to gas would save Bulgaria 46 million tonnes of CO2 and would bring societal benefits of €2.4bn.*</p>

Key implications from peer-country NECPs



Many NECPs highlight the role of natural gas in the future power generation mix

Relevant measure	Countries	Considerations for Bulgaria
Electricity generation		
 <p>Nuclear – Certain countries are also increasing nuclear build.</p> <ul style="list-style-type: none"> Increased reliance on nuclear – <i>New build of nuclear reactors to compensate for a reduced role of coal, studies for the deployment of further reactors, lifetime extension of existing reactors. Note: The role of gas may increase if there are nuclear construction delays</i> 	Czechia, Hungary, Poland, Romania	<p>Nuclear – Many of Bulgaria’s peers also have nuclear in their energy mix and some expect this role to grow. A delay in construction may imply a greater reliance on gas to achieve decarbonisation and security of supply.</p>
 <p>Renewables – The level of renewables deployment varies.</p> <ul style="list-style-type: none"> Moderate increases in renewables – <i>Organisation of renewables tenders, support mechanisms (CfD or FiT), specification of procurement targets</i> Large increases in renewables / High renewables share – <i>Investment aid for renewable pilot projects, competitive auctions for support with procurement targets, ETS income used to fund renewables incentives, targeted auctions for less mature technologies or projects in isolated parts of the country (e.g. islands) with potential participation of public funds</i> Network adaptation for the integration of renewables – <i>Creation of schemes to procure storage solutions, especially hydro pumped storage and batteries, schemes to incentivise and remunerate demand-side response</i> 	Czechia, Hungary, Poland Greece, Romania, Spain, Slovenia Greece, Hungary, Romania, Spain	<p>Renewables – Renewable energy (including small-scale renewables) has an increasing role in the energy mix of all the countries reviewed. Spain and Greece have particularly ambitious targets.</p> <p>In relation to storage, regional pumped storage projects may provide a direct competition to Bulgaria’s Yadenitsa pumped storage project (PCI).</p>

Key implications from peer-country NECPs



Many NECPs highlight the role of gas and decarbonised gas in industry and transport

Relevant measure	Countries	Considerations for Bulgaria
 Industry – Measures encourage fuel switching towards gas and biogas.		
<ul style="list-style-type: none"> Fuel switching towards gas – <i>Incentives for fuel switching, improved gas connections for large customers to encourage switching away from coal</i> 	Czechia, Greece, Spain	More ambitious programmes for fuel switching and the deployment of biofuels could be used to address the EU's feedback that further energy savings should be targeted.
<ul style="list-style-type: none"> Increased reliance on biogas – <i>Financial and institutional support for the transformation of biogas stations and connection to the gas system, development of licencing framework and technical specifications for injection of biogas into the natural gas network, aid to integrate renewables into industrial systems, incentives to encourage adoption and use of biogas</i> 	Czechia, Greece, Slovenia, Spain	
 Transport – Measures encourage fuel switching towards gas and biogas.		
<ul style="list-style-type: none"> Promotion of gas usage – <i>Incentives for fuel switching, development of a plan for the adoption of natural gas vehicles</i> 	Czechia, Greece	More ambitious programmes for fuel switching and the deployment of biofuels, hydrogen, CNG and LNG could be used to address the EU's feedback that further energy savings should be targeted. This may be supported by incentives or direct financing.
<ul style="list-style-type: none"> Increased build of CNG and LNG refuelling stations – <i>Support for LNG and CNG networks and other supporting infrastructure, including subsidies</i> 	Czechia, Greece, Poland, Slovenia	
<ul style="list-style-type: none"> Increased uptake of gaseous fuels including biomethane and / or hydrogen – <i>Financial and institutional support for the transformation of biogas stations and connection to the gas system, development of licencing framework and technical specifications for injection of biogas into the natural gas network, support mechanisms and incentives to encourage the adoption and use of biogas, development of pilot schemes for renewable gas in transport</i> 	Czechia, Greece, Slovenia, Spain	
<ul style="list-style-type: none"> Funding for alternative low-carbon mobility – <i>Creation of a low-carbon transport fund to support initiatives, provision of aid, grants, and/or tax incentives to bridge the cost difference between conventional and low-carbon vehicles</i> 	Hungary, Poland, Slovenia	

Key implications from peer-country NECPs



Many NECPs highlight the role of natural gas and decarbonised gas in heating

Relevant measure	Countries	Considerations for Bulgaria
 Heating – Measures encourage fuel switching towards gas and biogas.		
<ul style="list-style-type: none"> Promotion of gas usage – <i>Fuel switching, grants for gas-condensing boilers (funded by the ETS scheme)</i> 	Czechia, Greece	<p>Household gasification and further electrification are a target for Bulgaria. More ambitious programmes for fuel switching and the deployment of biofuels could be used to address the EU’s feedback that further energy savings should be targeted. Measures and funding targeting the sustainable utilisation of biomass in rural areas and small communities may also be proposed. This may be supported by incentives or direct financing.</p>
<ul style="list-style-type: none"> Encourage shifting away from polluting fuels – <i>Use of ETS auction income to fund incentives for energy efficiency measures, improved gas connections for large customers, promotion of solar heating, replacement of oil with biomass and renewable gases</i> 	Czechia, Romania, Slovenia	
<ul style="list-style-type: none"> Increased uptake of gaseous fuels such as biomethane and / or hydrogen, including through financial support – <i>Financial and institutional support for the transformation of biogas stations and connection to the gas system, development of licencing framework and technical specifications for injection of biogas into the natural gas network, incentives and support mechanisms to encourage the adoption and use of biogas, provide new renewables support for heating</i> 	Czechia, Greece, Slovenia, Spain	

Key implications from peer-country NECPs



Gas will also play a key role to improve market integration and improve competitiveness

Relevant measure	Countries	Considerations for Bulgaria
 Development of gas market hubs – Countries seek to improve gas market functioning and integrate their gas market with neighbours. <ul style="list-style-type: none"> Liquidity – <i>Improved market transparency and volumes of gas traded on the centralised market, project to deliver gas market coupling with neighbouring country</i> Improved market functioning – <i>Reform of retail and wholesale gas markets, improved competition in the retail market</i> Maximise use of existing infrastructure – <i>Capitalise on existing infrastructure to turn the country into a hub for natural gas, renewable gas and hydrogen</i> 	<p>Czechia, Romania</p> <p>Greece, Spain</p> <p>Spain</p>	<p>Bulgaria seeks to position itself as a regional energy hub. This positioning was reinforced with the recent amendment to the Energy Act (Oct. 2019), which provides for the creation of an organised natural gas exchange and a natural gas release programme.</p> <p>Further actions taken by peers include regional market coupling and the optimisation of the use of gas infrastructure, which enables them to unlock the potential for gas.* Such actions would help address the EU's feedback that Bulgaria needs to define objectives for market integration and develop competition on its energy markets.</p>
 Research <ul style="list-style-type: none"> Peer countries allocate funds for research on gas-related topics – <i>Research topics include power-to-gas hydrogen, fuel cells, gas storage technologies and gas exploration technologies</i> 	<p>Greece, Poland</p>	<p>The allocation of funding to research on energy transition topics is an essential part of the effort to develop new affordable solutions. The EU has highlighted that Bulgaria needs to define clear research objectives and targets.</p> <p>The Maritsa East region has the human and infrastructure resources to become a regional centre for energy transition and research.</p>
 Gas as a source of competitiveness <ul style="list-style-type: none"> The deployment of new fuel for power, transport, industry and heating (see fuel transition slides) is seen as a source of competitiveness and as an opportunity. 	<p>EU-wide</p>	<p>Countries that successfully manage the transition may be able to market their solutions more widely. Similarly, the development of a gas market hub as envisaged in Spain and Bulgaria can be of strategic importance for the economy and requires adequate infrastructure and a degree of domestic gas usage.</p>

Key implications from peer-country NECPs

Most countries are planning large gas infrastructure projects* to support the role of gas and decarbonised gas

Relevant measure	Countries	Considerations for Bulgaria
 Internal transmission and distribution networks <ul style="list-style-type: none"> Upgraded transmission / distribution networks, including preparation for new gas types – <i>Upgrades for introduction of new gas types, distribution network expansion to enable residential and commercial use of natural gas in new regions and/or for new users</i> Significant expansion of networks to new areas of the country – <i>Construction of 2,000 km of new pipelines, expansion of networks to new communities, investment to connect onshore and offshore fields</i> 	<p>Czechia, Greece</p> <p>Poland, Romania</p>	<p>A number of gas infrastructure developments are needed to support the creation of the Balkan Gas Hub in Bulgaria, in particular at the distribution level and to increase interconnection. The EU has asked Bulgaria to define an investment plan for the transition.</p> <p>Additionally, increases in network capacity in connected regional markets are likely to increase infrastructure and interconnection utilisation in Bulgaria itself.</p>
 Interconnection <ul style="list-style-type: none"> Upgraded/increased interconnection capacity – <i>Examples include pipelines between Czechia and Poland or Romania and Bulgaria</i> Financial support to build new interconnectors – <i>Significant gas interconnection projects are underway across Europe, in particular in Eastern Europe, to reduce market isolation. CEF funds are allocated to these projects.</i> 	<p>Czechia, Romania</p> <p>Greece, Hungary, Poland, Romania, Slovenia</p>	<p>Increased interconnectivity improves security of gas supply and competition on the market. Gas infrastructure development is needed to support the Balkan Gas Hub in Bulgaria and enable access to the Bulgarian market. It will also increase the integration of Bulgaria with other European markets as requested by the EU.</p>

*Baringa's report identifies needs selected infrastructure investment: <https://www.baringa.com/en/insights-news/points-of-view/bulgaria-role-of-gas-in-decarbonisation/>

Key implications from peer-country NECPs



Most countries are planning large gas infrastructure projects* to support the role of gas

Relevant measure	Countries	Considerations for Bulgaria
 LNG <ul style="list-style-type: none"> • Modernise existing terminal – <i>Increased LNG regasification capacity</i> • New FSRU – <i>Construction of a new LNG terminal</i> 	<p>Poland</p> <p>Greece</p>	<p>Bulgaria expressed an interest in participating in the FSRU at Alexandroupoli. Access to LNG improves security of supply and diversification of supply sources as requested by the EU.</p>
 Storage <ul style="list-style-type: none"> • Upgrade existing infrastructure – <i>Funding for improved gas storage facilities, including larger storage capacity</i> • Build new storage infrastructure – <i>Financial support to gas storage projects and security of supply targets, investment in LNG storage</i> 	<p>Poland</p> <p>Czechia, Greece</p>	<p>The construction of new storage facilities could help improve security of supply, adding to the ongoing increases in UGS Chiren's capacity (PCI). Regional gas storage projects may be seen as competing to Chiren's expansion.</p>

*Baringa's report identifies needs selected infrastructure investment: <https://www.baringa.com/en/insights-news/points-of-view/bulgaria-role-of-gas-in-decarbonisation/>

Key implications from peer-country NECPs



Given that gas is a key transition fuel, measures are taken to ensure the security of gas supply

Relevant measure	Countries	Considerations for Bulgaria
 Diversification of gas sources <ul style="list-style-type: none"> Regulation for the diversification of gas supplies – <i>Implementation of a maximum threshold for single-source dependency, including a threshold for gas</i> Diversification of imported energy supplies – <i>Connection of onshore and offshore gas fields, diversified gas supply contracts, interconnector projects contribute to diversification of supply sources (See interconnection)</i> 	<p>Poland</p> <p>Romania, Spain (and others with gas IC projects)</p>	<p>Market opening and competition helps reduce gas prices and ensure security of supply.* The opportunity to diversify supply sources is increasing in Bulgaria, following the EC's investigation into Gazprom's commercial terms. This is currently a key priority, highlighted in the EU's feedback on Bulgaria's draft NECP.</p>
 National production <ul style="list-style-type: none"> Production targets – <i>Defined gas production targets to 2030</i> Incentivise oil and gas exploration and increase recovery – <i>Stimulate investment in exploration and increase recovery rate from mature fields</i> 	<p>Poland</p> <p>Romania</p>	<p>Given the ongoing exploration activity in the Black Sea, Bulgaria could conceivably seek to stimulate investment further. Discovery of significant indigenous resources would contribute to security of supply and to Bulgaria's position as a regional gas hub.*</p>
 Reserves <ul style="list-style-type: none"> Maintain gas reserves – <i>Mandatory fossil fuel reserves, Committee to develop a national security strategy</i> 	<p>Romania, Spain</p>	<p>Given the existence of a storage facility and the current project to increase storage capacity, Bulgaria may increase minimum reserve requirements on Bulgargas and/or on district heating companies.</p>

*This is discussed further in Baringa's report: <https://www.baringa.com/en/insights-news/points-of-view/bulgaria-role-of-gas-in-decarbonisation/>

Key implications from peer-country NECPs

Funding and managing the impacts of the transition is a key theme

Relevant measure	Countries	Considerations for Bulgaria
 Transition funds <ul style="list-style-type: none"> Creation of a fund and plan for the transition of coal regions – <i>'Special Account for the Fair Transition of Lignite Areas', with a budget of €60m, 'Just transition' plan for a fair and managed transition away from coal mining, with a budget of €250m (See Section on delivering the transition)</i> 	Greece, Spain	<p>Other countries have defined plans for the phase-out of coal, and established a fund a 'fair and just' transition in the regions most affected by the coal exit. These plans show how Bulgaria may define a medium-term strategy for coal exit while helping the regions affected to adjust, and certain elements may be transferrable to the Bulgarian context. The requirement to integrate just and fair transition aspects into NECPs is a key element of feedback provided by the EC.</p> <p>Baringa's study of an accelerated transition from coal to gas also highlighted the importance of a support package for the transition, with an order of magnitude of around €2bn.</p>
 Projects of Common Interest ('PCI') projects <ul style="list-style-type: none"> Large infrastructure projects are identified as PCI and are eligible for EU funding from the Connecting Europe Facility ('CEF') – <i>These include gas interconnection and gas storage facilities discussed in the infrastructure section.</i> 	Greece, Czechia, Hungary, Poland, Romania*	<p>EU financial support is available for large infrastructure projects that facilitate market integration in Europe.</p>

* <https://www.baringa.com/en/insights-news/news/energy-transition-in-bulgaria-from-coal-to-gas/>

**Source: NECPs and https://ec.europa.eu/energy/infrastructure/transparency_platform/map-viewer/main.html

Country overview – Benchmark countries

Overview of other NECPs – European countries exiting coal

Country overview – Introduction

- ▲ In this Section, we undertake a high-level scan of the draft NECPs published by a further group of countries: Germany, Denmark, Finland, Ireland, Italy, The Netherlands and Portugal. These countries were chosen as a relevant **benchmark** for decarbonisation policies due to:
 - The importance of coal in their energy mix; and/or
 - The existence of plans for the phase-out of coal by 2030.
- ▲ Most of these countries are located in Western Europe and their favourable financial situation may enable them to pursue the goals of energy transition at a faster pace than in some parts of Eastern Europe. While the measures and timelines adopted by these countries may not be applicable in the short term in Bulgaria, this high-level scan provides an overview of measures that may be adopted further along the decarbonisation path.
- ▲ For each benchmark country, we highlight the key evolutions and ambitions defined in their NECP, with a focus on power generation and the respective role of coal, gas and technologies deployed to achieve decarbonisation and security of supply. We also list examples of measures underpinning these ambitions, such as funding schemes, network investments and incentives to support the role of cleaner fuels in the transition.
- ▲ The format of the review is as follows:



Country

<ul style="list-style-type: none">▲ High-level ambitions set out in the NECP.
<ul style="list-style-type: none">➤ <i>Example measures to support the plan.</i>

- ▲ Further details on each country's NECPs and future energy mix are available in Appendix 1.

Country overview – Benchmark countries (1 of 4) Baringa



Germany

Gas as a transition fuel (expected)

- ▲ The draft NECP was published before the findings of the Coal Commission. The final NECP is expected to be updated to reflect the roadmap for **coal exit by 2038** (including financial support), in parallel with the phase-out of nuclear by 2022.
- ▲ In the draft NECP, gas-fired capacity build-out is expected to increase significantly between 2020 and 2030, even as the Coal Commission's findings have not been published. Germany's final NECP is therefore expected to show an even larger role for gas during the transition.
- ▲ Germany is continuing its ambitious deployment of renewables.
 - *The final NECP will contain an overview of the measures and support for a fair transition. This will be an integrated transition plan, based on the recommendations of the Coal Commission, including funding and plans to redevelop coal regions.*
 - *Measures for security of gas supply include reserves requirements and an increased use of LNG.*
 - *€1bn is earmarked to support clean mobility, including natural gas mobility and associated infrastructure.*



Denmark

Role for biogas

- ▲ The draft NECP sets out detailed measures to become a carbon-neutral society.
- ▲ Denmark is **phasing out coal by 2030** and developing renewables, in particular offshore wind.
- ▲ The NECP also includes measures encouraging the use of biofuels across key sectors. In particular, biogas is likely to play a central role in power, transport and heat.
 - *Conventional thermal plants are being decommissioned or converted to biofuel.*
 - *Significant funding is available to support the transition in the transport sector and a blending requirement (% of biofuel) is introduced.*
 - *Grants are introduced for biogas usage in heating.*
 - *A gas pipeline is built to enable gas flows from Norway to Poland via Denmark.*

Country overview – Benchmark countries (2 of 4) Baringa



Finland

Gas for security of supply, role for biogas

- ▲ Finland intends to **phase-out coal by 2030**, with an increased reliance on new nuclear (construction of two nuclear reactors – OL3 and another in the 2020s), renewables and biofuels.
- ▲ Gas is as an important aspect of security of supply, recognised through the creation of a regional gas market with Baltic States. The role of gas in electricity generation may be essential if there are delays in the commissioning of nuclear power plants, to achieve decarbonisation and security of supply.
- ▲ Finland also aims to significantly increase the use of biogas in electricity generation, transport, heat and agriculture.

- *Finland introduced specific targets of biogas uptake across sectors and a blending requirement (% biofuel).*
- *Gas infrastructure is being developed, with two new LNG terminals and a gas pipeline to the Baltic states, enabling the creation of a regional gas market.*



Ireland

Gas as a transition fuel

- ▲ Ireland will **phase out coal and peat by 2030**, and has earmarked natural gas as an essential transition fuel.
- ▲ Natural gas consumption is expected to increase by 23-53% by 2030 and by 70-98% by 2040 compared to 2017 levels.
- ▲ The plan also sets out an array of measures to increase biofuel and biogas usage in heating and transport.

- *Ireland is undertaking the required infrastructure reinforcements to ensure continued security of supply (LNG terminal, increased interconnector capacity, encouragement of upstream exploration).*
- *The National Development Plan specifies investments to deliver the transition to 2027, estimated at €21.8bn.*
- *Further measures incentivise biofuel and biogas usage in heating and transport, through pilot projects, financial support and blending requirements.*

Country overview – Benchmark countries (3 of 4) Baringa



Italy

Gas as a transition fuel

- ▲ Italy expects **coal to be phased-out by 2025**. There will be a degree of coal-to-gas switching and gas is seen as a key fuel for power generation in the ‘short-mid term’. Gas will also remain an important fuel for industrial and domestic uses.
 - ▲ Italy aims to further gas market integration, reduce the risk of supply crises, and reduce spreads with other gas hubs.
 - ▲ Measures are taken to encourage biogas uptake for heat and transport.
- *3GW of coal-to-gas switching is expected.*
 - *Measures encouraging biogas uptake for heat and transport include incentives, regulation and certification of biofuels and the use of hydrogen for public transport.*
 - *Planned investments include gas network expansion, new interconnection (TAP) and a new LNG terminal. Additional interconnectors are also being studied.*



The Netherlands

Natural gas for power, biogas (expected)

- ▲ The draft NECP was submitted before the publication of the Dutch Climate Agreement, which sets the roadmap to carbon neutrality and will be the basis for the final NECP.
 - ▲ Coal will be **phased out by 2030**.
 - ▲ Although natural gas is expected to retain an important role in power generation and in industry, a number of measures are implemented to reduce consumption across all sectors (including exports), and extraction.
- *A coal fund will be set up for the transition to facilitate finding new jobs.*
 - *Measures are implemented to reduce gas consumption and extraction, e.g. pilots for gas-free neighbourhoods, and the end of extraction in Groningen.*
 - *Gas infrastructure and TTF market liquidity are maintained, and a gas conversion plant is planned.*

Country overview – Benchmark countries (4 of 4) Baringa



Portugal

Natural gas for power, biogas

- ▲ Portugal has committed to **phasing out coal by 2030**, with an increased reliance on endogenous renewable sources, and interconnections with other markets.
 - ▲ Gas power stations are expected to remain a source of baseload power in the generation mix.
 - ▲ Electrification, the use of biofuels and hydrogen, and renewable energy are seen as a way to further decarbonise other sectors.
-
- *To accelerate the phase-out of coal, Portugal is increasing taxes on electricity generated by coal through a variety of instruments.*
 - *Transport infrastructure for alternatively-fuelled vehicles will be developed.*
 - *The National Investment Plan is being developed to provide a roadmap for the investments required to deliver the transition. Investments include increased interconnection towards Spain and France.*

Key implications – Benchmark countries

Benchmark NECPs show the range of measures taken by countries further along the decarbonisation path. Some of these lessons may be transferred into Bulgarian energy policy



Fuel transition in power, industry, transport and heating

A number of benchmark countries have defined an **integrated energy transition plan**. In Germany and the Netherlands, the plan was defined with extensive **involvement of energy stakeholders**.

All benchmark countries are **phasing out coal** for power by 2030, except for Germany (2038). A number of countries (Germany, Ireland and Italy) see **gas as a transition fuel**, while others are moving out of fossil fuels for power generation.

In transport, many benchmark countries take an ambitious **approach**, with bans of petrol/diesel car sales and the introduction of blending requirements. Measures to decarbonise heat include incentives, grants and regulation.



Role of gas in regional integration and competitiveness

Some NECPs discuss the countries' strategies to become or retain their position as a **regional gas market hub** (Finland/The Netherlands). Infrastructure is created or maintained to support this strategic role.



Development of infrastructure

Where required, benchmark countries are undertaking upgrades and expansion of national gas **distribution and transmission networks**, developing new gas **interconnection**, new **LNG** terminals and new gas **storage** infrastructure. Some also have a **detailed investment plan** (Ireland, Portugal) that sets out the investments required to deliver the energy transition.



Security of gas supply

Benchmark countries have a plan to maintain security of supply, including new **interconnection**, mandatory gas **reserves** and the sourcing of gas from **varied suppliers**. Their markets are on balance less isolated than Eastern European countries.



Financing the transition

Energy transition plans are accompanied with **significant transition packages**, including for the support and redevelopment of coal regions (Germany) and for the exit of coal in power generation, including compensation to power plant owners (Germany, The Netherlands).

Delivering the energy transition

Introduction – Delivering the energy transition



- ▲ In this Section, we review mechanisms that may be used to deliver the energy transition.

- ▲ We provide an overview of transition plans adopted by Spain and Greece.
 - Of the peer countries, Spain and Greece have the clearest transition plan for coal and are the most advanced in planning the energy transition.
 - Spain’s Just Transition plan has been identified as an example of good practice that may be exported.
 - Greece’s transition plan relates to the years 2018-2020 and further actions are expected to be published in light of the proposed phase-out of coal by 2028.

- ▲ Although Germany is not part of the ‘peer’ group, we discuss its coal phase-out plan, together with estimates of the funding required for the transition.
 - In this case, the direct compensation to owners and employees is expected to be self-funded, although other sources may contribute to the wider restructuring of coal regions.

- ▲ We also present an overview of the way Czechia is currently organising its energy transition.

- ▲ Finally, we compile a non-exhaustive list of financing sources which may be used by Bulgaria to finance the transition, presented at slides 36-37.

Delivering the energy transition



Transition deals have been signed in Spain and Greece to ensure a just and fair transition away from coal and re-develop coal regions. Both deals are the result of a concerted approach with industry stakeholders, including unions

Spain



- ▲ In October 2018, an agreement was reached between the newly elected socialist government and coal unions ahead of the closure of 10 mines by end of 2018.
- ▲ **€250m** have been provided by **Government** for a 'Just transition' in mining regions over 2019-27.
- ▲ The goal is to meet climate targets in a socially acceptable manner and to make plans for a successful and sustainable redevelopment of coal mining regions.
- ▲ This deal can be exported as an example of good practice of meeting climate goals without leaving anyone behind.

Stakeholder management

- ▲ The 'Just Transition' package aimed at providing:
 - **Social measures**, including early retirement for older workers, welfare benefits and reskilling of miners for the renewable industry.
 - **Socio-economic measures** such as site restoration and regeneration, infrastructure development, funding for business ventures and tailored action plans for the different mining communities.
- ▲ **Such measures, and the support package were negotiated between unions and the government.**

Greece



- ▲ Over 2018-20, Greece is planning to use part of its EU ETS auction revenues (at least **€60m**) to finance the transition of a number of coal regions through the creation of a '**Special Account for the Fair Transition of Lignite Areas**'.
- ▲ The Fair Transition Support Initiative will continue over 2021-30 through the use of **ETS surplus revenue**.
- ▲ Further funding and a more detailed plan are expected to be announced to deliver the phase-out of coal by 2028.

Stakeholder management

- ▲ Measures promoted under the Fair transition will be **agreed as part of a public consultation** and will be focused on:
 - Clean energy, including biomass/biogas projects
 - Energy efficiency and energy poverty
 - Promotion of the primary sector and of a circular economy
 - Industrial heritage of lignite areas
 - Regional action plans and training programmes
 - Entrepreneurship and innovation programmes
- ▲ **In Greece, the largest coal union has shown support for the Just Transition efforts and participates actively in discussions with environmentalists.**

Delivering the energy transition



In Germany, the integrated plan to phase-out coal will largely be financed by Federal government funds. The plan was developed in concertation with coal unions and proposes tangible actions for the transition in coal regions

The organised phase-out of coal

- ▲ In January 2019, the 'Coal Commission' published its plan to enable Germany to meet the objectives of the Climate Action Plan 2050.
- ▲ The plan organises the retirement of coal as follows:
 - In the short term, the oldest coal plants retire on a voluntary basis through **mutual agreements**, or via **incentives** for an accelerated closure.
 - From 2023, a more proactive approach is adopted with auctions for **decommissioning support** or **mutual agreements** on the compensation for employees and power plant operators. June 2020 is the deadline for reaching an agreement, beyond which **disputes** will be settled by legal means.
 - To encourage early plant retirement, compensation falls for later retirements.

Financing the transition

- ▲ The total amount of support for coal phase-out has yet to be agreed through mutual agreements.
- ▲ The value of the compensation package will take into account emissions savings, plant ownership, and the number of employees affected.
- ▲ Coal plants' EU ETS certificates will be cancelled as they retire. Coal plants that are long on ETS certificates will be able to sell these rights.
- ▲ Media estimated that coal regions may need **€40bn** for the transition over the next 20 years.
- ▲ **Direct compensation packages will be provided through state budget. They will not be financed through a surcharge on power prices.**
- ▲ Support to coal regions will be voted in **federal law**, to prevent future governments from amending it retroactively.

An integrated plan

- ▲ The Coal Commission report contains extensive propositions to mitigate the impact of coal phase-out.
- ▲ Part of the support package will be used for development projects in coal regions. Non-federal funds may also be accessed for the economic restructuring of coal regions.

Stakeholder management

- ▲ **The Coal Commission's recommendations were developed multilaterally**, involving industry stakeholders, union representatives and politicians.
- ▲ **Coal unions** were a key stakeholder in the discussions. Support will enable:
 - Coal regions to **redeploy energy expertise** towards renewables.
 - The **conversion** of coal sites to competitive industrial parks.
 - New **infrastructure** projects.

Delivering the energy transition



Czechia is currently organising its transition away from coal, through the creation of a Coal Commission

RE:START plan

- ▲ In 2015, the Czech government began to implement a strategic framework for the economic restructuring of the country's coal mining regions called **RE:START**.
- ▲ The goal was to diversify the regional economy, improve the training of the workforce and increase the share of high-value added industry.
- ▲ The implementation of RE:START is based on annual action plans with a mix of short-term and longer-term actions.

Initial outcomes

- ▲ The first years of the plan have focused on creating an appropriate governance structure, matching national institutions with regional counterparts to identify the specific needs of each region.
- ▲ In 2019, a **Coal Commission was created** to deal with topics related to coal phase-out. Outcomes and recommendations from the Coal Commission will be adopted by the Czech government by **end of 2020**.

Financing the transition

- ▲ RE:START allocated **€1.5bn by 2030** to development activities in coal regions.
- ▲ **Funding** for the programme comes from EU Structural funds (€303m), a special national privatization fund (€80m) and from national funding (remainder).
- ▲ Further funding will be allocated as needed.

Stakeholder management

- ▲ The management of the plan includes a **defined governance**, capitalising on regional expertise and providing relevant information to the national level for appropriate policy design. The governance framework includes thematic working groups dealing with the key pillars of the energy transition. Although trade unions are largely opposed to measures that might impact coal negatively, the largest state-owned generation operator is currently re-orienting its business model away from coal.
- ▲ The creation of the **Coal Commission** enables to adopt a concerted approach for an accelerated transition away from coal, with recommendations due to be published by September 2020. **The Coal Commission is built on the model of its German counterpart** and comprises 19 members, including stakeholders from the industry, labour unions, NGOs and local communities. The Commission has three **sub-committees** for (i) the timing of coal phase-out, (ii) the measures to accompany it, and (iii) the transition policies in coal regions.

Other financing sources



The budget of existing financing vehicles is significant compared to that needed to accelerate the energy transition in Bulgaria

- ▲ Baringa's previous study* found that a **significant support package** would be needed for an **accelerated transition from coal to gas** in Bulgaria. Using data from existing transition plans, adapted to Bulgaria, we provided a high-level estimate of the support package, at around **€2bn**.
- ▲ In the remainder of this Section, we show that significant resources are available for the financing of the transition, through a range of funds and organisations.

Coal Regions in Transition Platform



- ▲ The **Coal Regions in Transition Platform**, under European Commission leadership, provides opportunities to discuss how these regions can best modernise their economies in line with a clean energy transition that also focuses on social fairness, new skills and financing for the real economy.
- ▲ **Pilot projects are underway in 14 regions**, across Poland, Greece, Slovakia, Czechia, Romania, Spain, and Germany. Further observers (e.g. Ukraine) are also invited.
- ▲ **This platform may be particularly useful for Bulgaria in the delivery of the energy transition. The Maritsa East region could benefit from joining the pilot projects.**

European Investment Bank (EIB) Group



- ▲ In 2019, the EIB Group had a budget of **€64bn**, split between innovation, environment, infrastructure and SMEs. Of these actions, **€16.1bn** were dedicated to **climate change** in the areas of mitigation, adaptation, renewable energy, research, energy efficiency and low-carbon transport.
- ▲ EIB 'offers to organise dedicated **Energy Finance workshops** with interested Member States to identify how its **lending and advisory services can be most effectively directed towards supporting [NECPs]**.'
- ▲ EIB mentions that 'switching from oil or coal to natural gas may reduce greenhouse gas emissions in the short term'
- ▲ Support will be available for gas-fired generation with emissions below 250gCO₂ per kWh electricity (e.g. CHP, gas turbines with a biofuel blend)
- ▲ The EIB has launched the **European Fund for Strategic Investments** ('EFSI'), to help overcome the investment gap in the EU. The EFSI has a budget of **€33.5bn**, with joint EU and EIB financing. Sectors of key importance for the EFSI include investment in strategic infrastructure (including energy), renewable energy and efficiency.
- ▲ *Bulgaria is already a beneficiary of EFSI funds and may request EFSI funds for further projects.*

* <https://www.baringa.com/en/insights-news/news/energy-transition-in-bulgaria-from-coal-to-gas/>

Other financing sources

The budget of existing financing vehicles is significant compared to that needed to accelerate the energy transition in Bulgaria

Projects of Common Interest (PCIs)



- ▲ Key **cross-border infrastructure** projects linking the energy systems of EU countries can be considered as PCIs. Such projects are eligible for Funding under the **Connecting Europe Facility** (CEF), a €30bn fund for energy, transport and digital infrastructure.
- ▲ *CEF funded energy infrastructure projects for a total of around **€4bn** over 2014-19.*
- ▲ *A number of infrastructure projects located in Bulgaria currently benefit from CEF funding.*

EU ETS auction revenues



- ▲ The EU ETS Directive provides that **50% or more of revenues** from auctioning emissions allowances should be used to support **climate and energy-related initiatives**, such as emissions reductions, renewables development, carbon capture and storage, energy efficiency, low-emissions transport and measures to avoid deforestation.
- ▲ *In the past, Bulgaria used **€137m EU ETS revenues** to support renewables deployment and a national programme for energy efficiency.*
- ▲ *ETS revenues may also contribute to the transition away from coal. For example, Greece has earmarked **€60m of EU ETS revenues** for the '**Special Account for the Fair Transition of Lignite Areas**'.*

Further EU funds



- ▲ Relevant **European Structural and Investment Funds** ('ESIFs') include :
 - **European Development Fund**, for a balanced development in the EU, with a focus on topics including the low-carbon economy.
 - **European Social Fund**, for employment-related projects across the EU.
 - **Cohesion fund**, for transport and environment projects in countries where income is less than 90% of EU average. Budget was €63.4bn over 2014-20 and Bulgaria is one of the eligible countries.
- ▲ *These three ESIFs had a budget of **€7.37bn over 2014-20 for Bulgaria**. Bulgaria has used some ESIF funds for the deployment of renewable energy and energy efficiency purposes (€502m over 2014-20).*

Conclusions

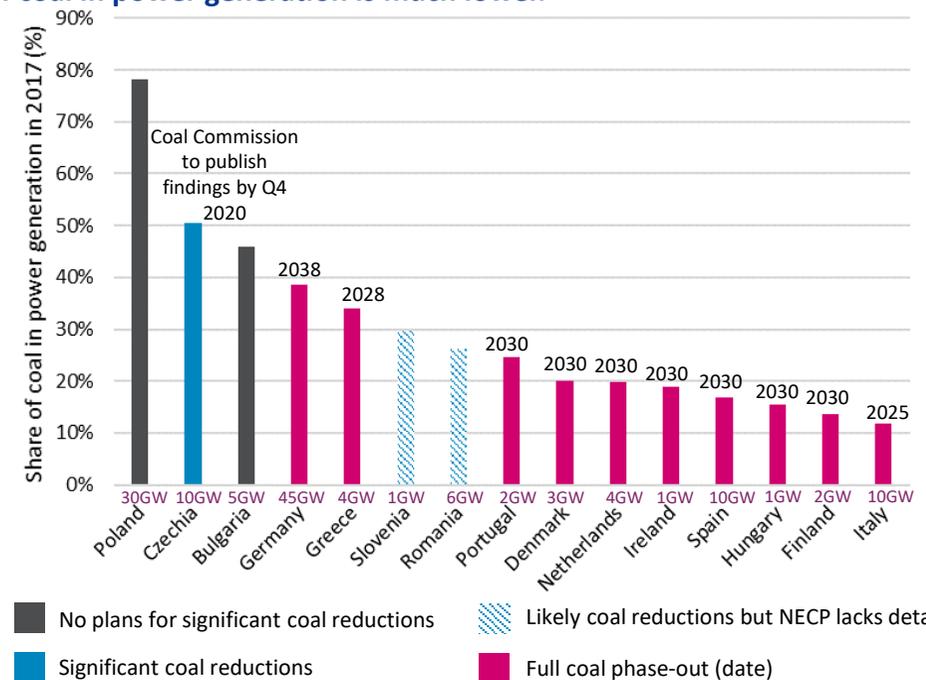
Implications for Bulgaria

Conclusions (1/3)

A strategy for an accelerated transition away from coal is urgently needed for Bulgaria. Based on our review of peer and benchmark NECPs, a target date may be suggested for the phase-out of coal



- ▲ **Peer countries are planning significant reductions in the use of coal in power generation.**
 - Greece, Hungary and Spain have announced the **phase-out of coal before 2030**, even as Greece’s share of coal in power generation is above 30%.
 - Czechia also announced significant reductions in the role of coal in power generation from 50% to 11-21% by 2040. In September 2020, the Coal Commission will provide its recommendations for an organised phase-out of coal.
 - Slovenia’s and Romania’s NECPs are lacking in detail but imply that coal generation is likely to reduce in the future.
 - Only Poland plans a substantial role for coal in electricity generation in the medium term due to coal’s current importance as a power generation fuel, at above 75% of Poland’s electricity.
 - **Bulgaria’s position is similar to that of Poland, although its share of coal in power generation is much lower.**
- ▲ **All benchmark countries** are planning the phase-out of coal by 2030**, except for **Germany**, where coal is phased-out by **2038** due to the higher share of coal for power generation (close to 40%).
- ▲ **In the context of increases in EU ETS prices towards €45/tCO2 by 2030 and decarbonisation, a long-term strategy for an accelerated coal phase-out is urgently needed for Bulgaria to keep up with other European countries.**
- ▲ **This strategy would include targets for reductions in coal usage and may suggest an end date for coal in the medium term. Based on our review of NECPs, the share of coal in power generation and the installed coal capacity across Europe, 2040 may be suggested as a target end date for coal in Bulgaria (to be studied).**



*<https://www.baringa.com/en/insights-news/news/energy-transition-in-bulgaria-from-coal-to-gas/>

**Germany, Denmark, Finland, Ireland, Italy, The Netherlands, and Portugal

Conclusions (3/3)

An integrated transition plan needs to be adopted across the sectors of power generation, industry, transport and heating



- ▲ **Natural gas is currently underplayed as a component of the energy mix for decarbonisation in Bulgaria.**
 - In the power sector, Bulgaria’s final NECP should include a more pro-active approach with **targets for coal-to-gas switching**, as recommended in the European Commission’s feedback on Bulgaria’s draft NECP. A Baringa study* found that an **accelerated coal-to-gas conversion**, with significant reductions in coal by the mid-2020s, would bring **societal benefits to Bulgaria estimated at €2.4bn.**
 - An increased role of gas may be delivered through plant conversion, refurbishments, new build and support schemes, such as those targeting high-efficiency cogeneration and the planned introduction of a capacity market.
 - The large-scale deployment of **natural gas and biofuels will also enable the decarbonisation of other sectors**, in particular heating, through expansions in the gas distribution networks and incentives for switching fuel.
 - Examples in other draft NECPs suggest that **gas is seen as transition fuel, playing its lower carbon role alongside renewables.**



- ▲ The definition of an ambitious **investment plan** for gas interconnection will enable access to **competitively-priced gas supplies** and enhance Bulgaria’s positioning as a **gas market hub in the Balkan region**. This will address the EC’s comments that Bulgaria needs to diversify its supply sources and to pursue further market integration. Measures facilitating **market functioning, regional cooperation and funding for research** will also be essential to accompany the energy transition.



- ▲ An energy transition plan for Bulgaria would also **define a vision and identify funding** for the transformation of coal regions, similarly to the **transition plans** adopted by Greece, Spain and Germany to ensure a fair transition. To be successful, Bulgaria’s transition plan will need to be designed in **consultation with all relevant stakeholders**, including industry representatives, unions, civil society organisations and government. Baringa’s 2019 study provided an order of magnitude for a support package that would accompany an accelerated coal-to-gas conversion in the mid-2020s, at around **€2bn.**



- ▲ **European vehicles are available to facilitate cooperation between Member States and finance an accelerated transition.** Joining the **Coal Regions in Transition** platform alongside EU regional neighbours such as Greece, Romania, Czechia, Slovakia, and Poland would enable Bulgaria to identify and implement best practices for the transition. Finally, **financial resources** available through vehicles such as the European Investment Bank would contribute a significant portion of the support package required to deliver a just transition in Bulgaria.



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