

SEE: GREEN CHALLENGES



Key Issues in Green Energy Investments – Transitioning to a Low Carbon Future

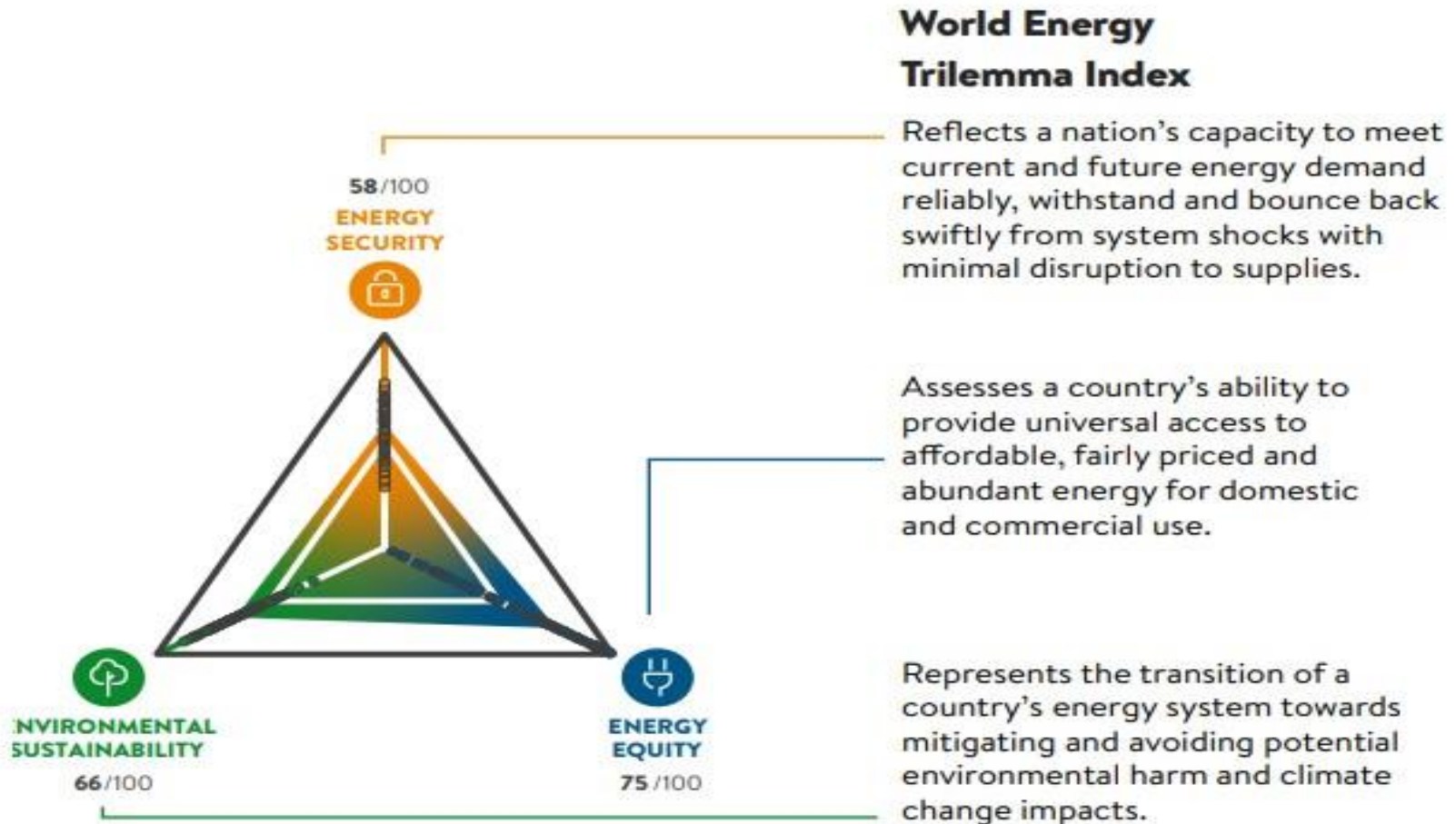
1. World Energy Trilemma
2. SEE Region: The “Greening” Progress
3. Recent Events & Challenges
4. The BSTDB and its Activities in Energy

The World Energy Trilemma

The World Energy Trilemma are three competing issues that drive energy competition, namely:

1. **Energy Security** – nation's capacity to meet current and future needs
2. **Energy Equity** – country's ability to provide universal and affordable access
3. **Environmental Sustainability** – transition of country's energy system

The World Energy Trilemma Index

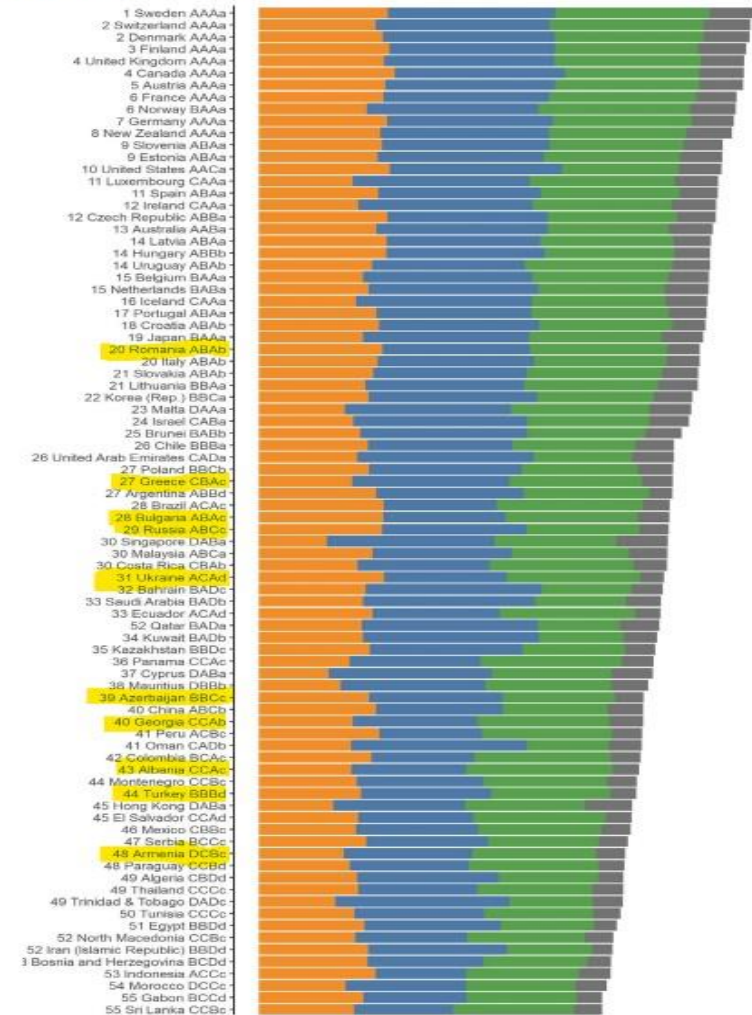


Source: World Energy Council

2022 World Energy Trilemma Index

ANNEX A

2022 WORLD ENERGY TRILEMMA INDEX



Top ranking countries are:
Sweden, Switzerland, Denmark,
Finland, UK and Canada.

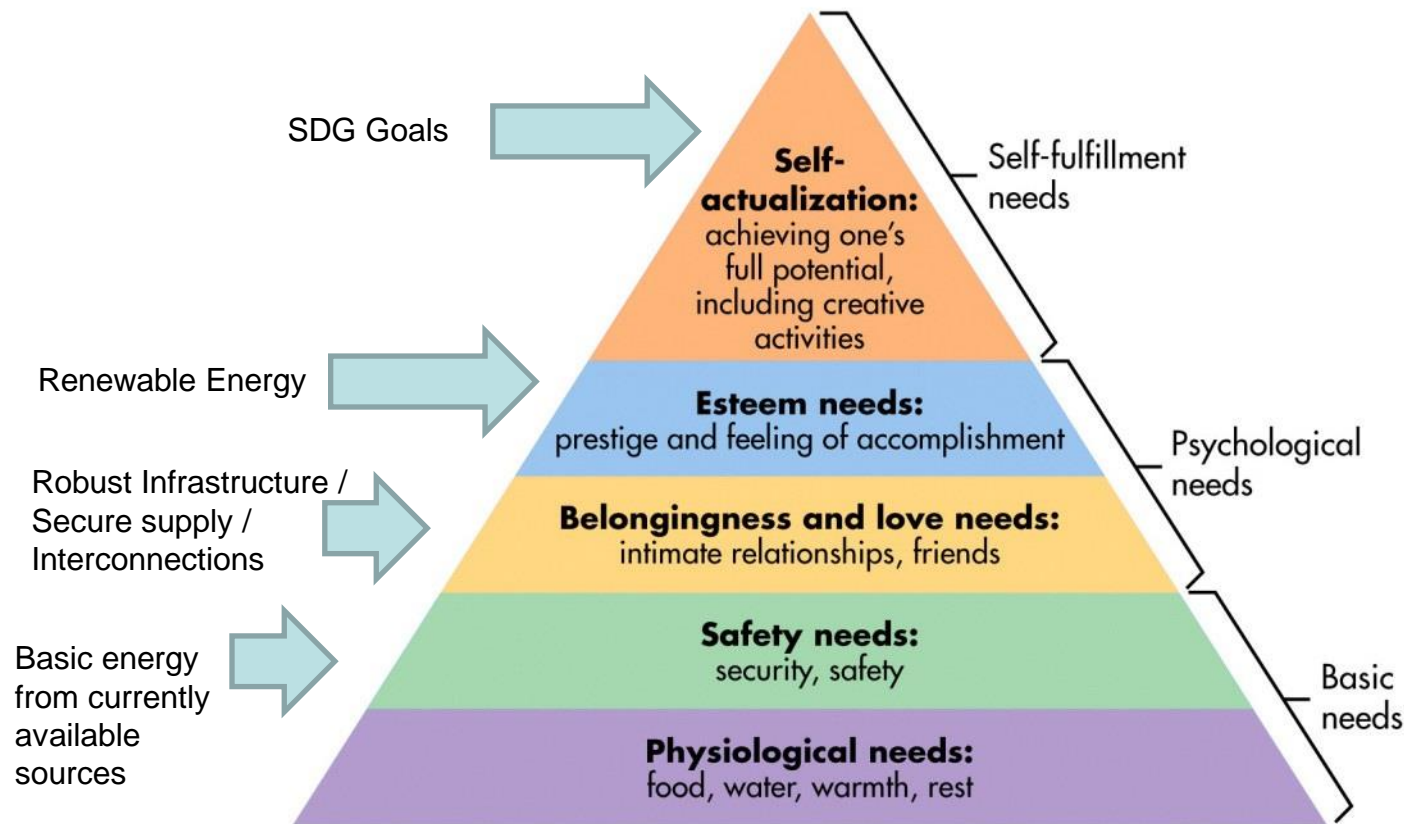
How do BSTDB Countries
compare:

- Romania (20) ranks highest of BSTDB Countries
- Followed by Greece (27), Bulgaria (28), Russia (29), Ukraine (31), Azerbaijan (39), Georgia (40), Albania (43), Turkey (44), Armenia (48), and Moldova (61)

Maslow's Hierarchy applied to Energy

Applying Maslow's Hierarchy to Energy:

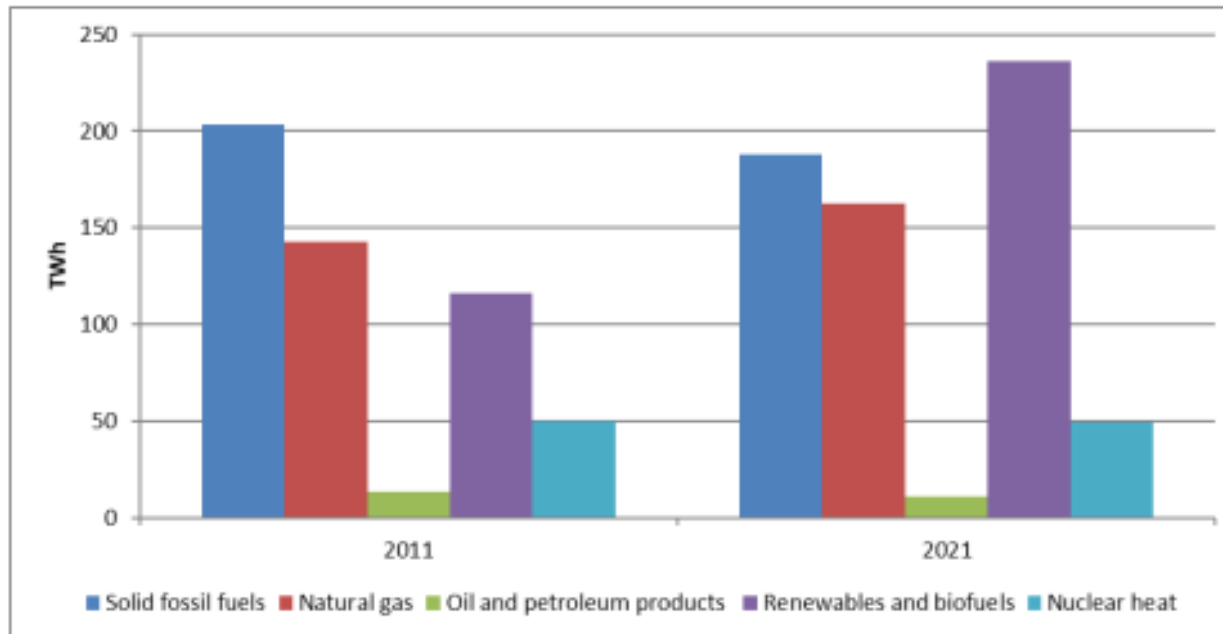
- 1. Developing Countries still fulfilling basic needs*
- 2. As more developed increase focus on Renewables*
- 3. Only most developed can focus on SDGs*



- **Europe** – was relatively balanced but recent gas & energy shocks changed that. Need for more coordination
- **SEE Countries** – primarily focused on Basic Needs of Security of Supply / Connectivity with some Renewables. Affordability is key.
- **Not all SEE Countries at same stage of Maslow's Hierarchy as applied to Energy.** But changes are forcing acceleration.

SEE Region: The “Greening” Progress

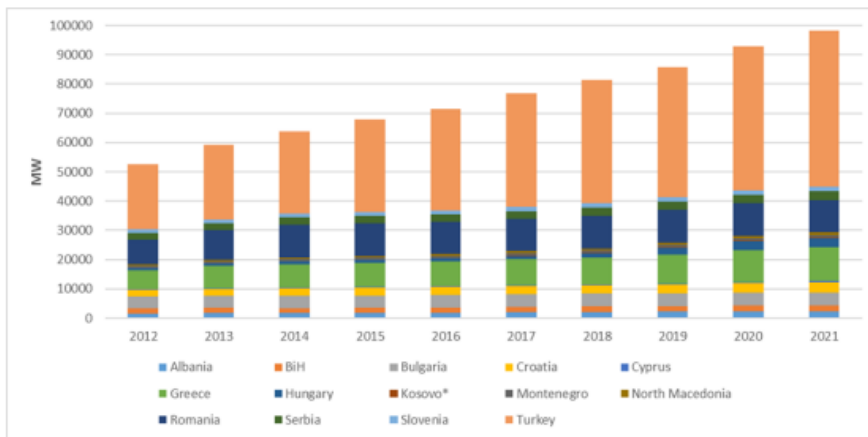
Figure 10: Gross Electricity Generation (TWh) by Type of Plant in SE Europe, 2011 and 2021



Source: Eurostat

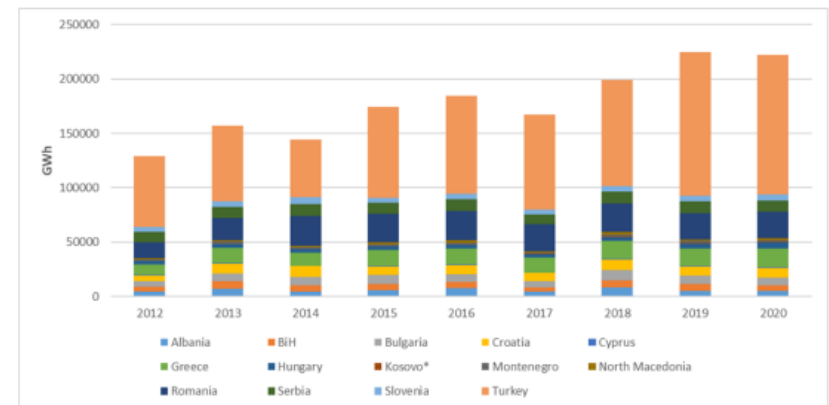
- Decarbonization continues & growth of RES

Figure 11: Total Installed RES Capacity (MW) by Country in SE Europe, 2012-2021



Source: IRENA

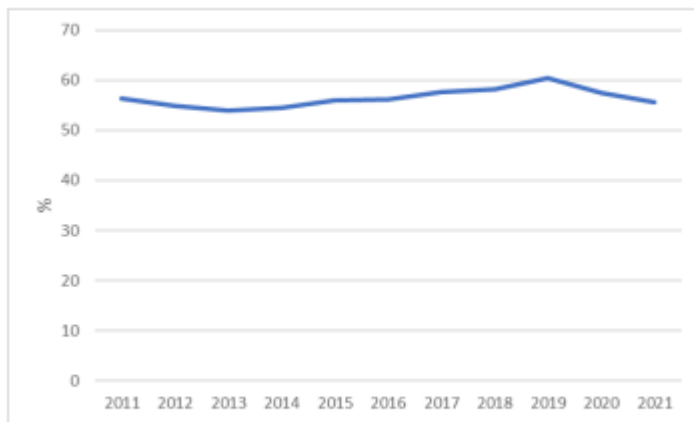
Figure 12: Power Generation (GWh) from RES, Including Hydro, by Country in SE Europe, 2012-2020



Source: IRENA

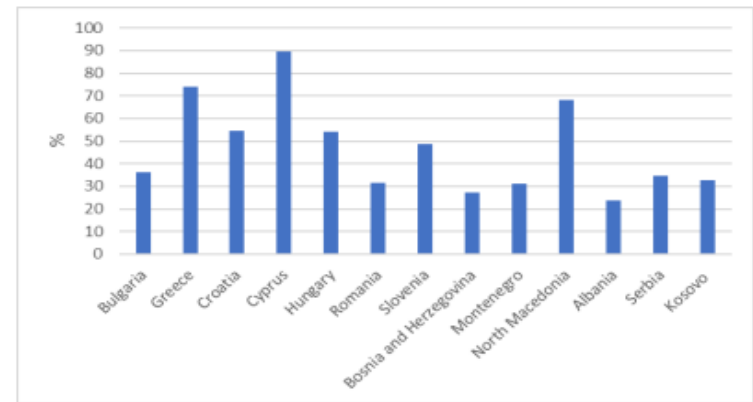
- Overall RES Capacity is growing in SEE

Figure 5: Evolution of the EU Energy Dependence (%), 2011-2021



Source: Eurostat

Figure 6: Energy Dependence (%) in SE Europe, 2021



Note: Eurostat does not provide any 2021 data for Turkey.

- High energy import dependence remains, with slight overall decrease
- In SEE energy dependence varies significantly

Russia's war in Ukraine and the decoupling from Russia's energy supply chains have dramatically exposed the limits and flaws of EU's approach to energy security, as well as the major failures in the implementation of the EU's Energy Union.

1. EU faces lasting **tensions between energy governance (national, regional and supranational) and the Energy Union Package**
2. EU faces a **dilemma between market and economic rationality and the return of state intervention and geopolitical competition.**
3. EU faces a **dilemma between long term climate goals and short- term fossil-fuel supply security**, while gas remains an essential bridge.
4. EU faces a **short-term dilemma between securing gas supply and volatile global LNG markets.**
5. EU faces a **long-term dilemma between energy independence aspirations and new supply dependencies and risks.**

Recent Events and Challenges

RECENT EVENTS (1)

- Move toward decarbonization has encouraged a shift to Renewable Energy Sources, or RES, (photovoltaics, wind, hydro, biomass, biogas) in their energy mix in replacement of other energy sources (coal, oil, gas, lignite etc.).



- However, such a process poses a series of challenges in terms of economic, financial, technical and regulatory obstacles; and it is not realistically expected to take place overnight, but over 10-20 years depending on a multiplicity of factors

RECENT EVENTS (2)

- Conflict in Ukraine has dramatically changed the dynamic. It exposed the vulnerabilities in Europe and sparked a global energy crisis.
- Increased unpredictability and volatility in energy commodity and regulatory markets



Sources: Refinitiv, Financial Times

- Focus on alternative sources of supply, restarting closed power plants, Renewables and possibly Nuclear.

Economic / Financial:

- Increased construction costs due to higher inflation
- Increased financing costs due to recent steep increases in underlying interest rates
- Uncertainty in terms of availability of debt financing from banks, given the uncertainty of the end buyer / purchaser of the energy produced from RES units
- Uncertainty in terms of remuneration and return rates on the side of the investor

Technical:

- Renewables that come onstream have a high geographical dispersion across larger geographic areas
- Unlike other energy sources, renewable plants are ideal base load power producing units
- Thus, the introduction of more renewables in the energy mix requires improved management, upgrade, and expansion of the electricity network, both in terms of capacity and geographical dispersion

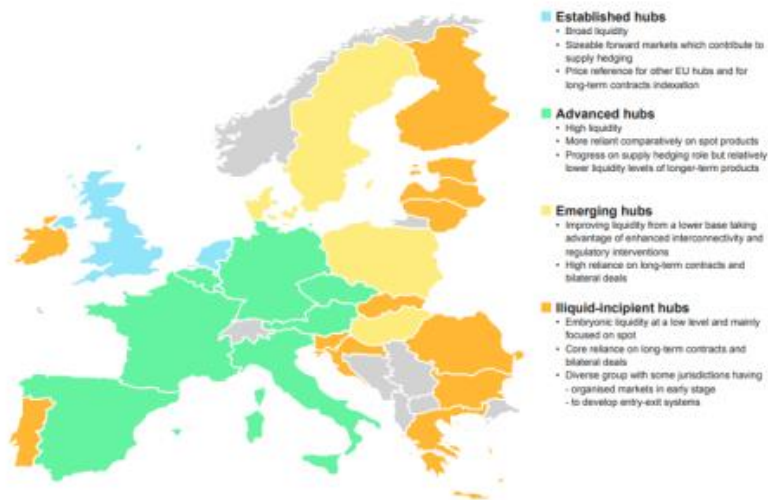
Regulatory / Political:

- The regulatory framework for the licensing process of newly developed RES projects keeps on changing abruptly in many cases, thus creating market uncertainty for both investors and lenders.
- To boost RES projects, we need to invest in strengthening the infrastructure of the electricity transmission network as well as increasing the administrative capacity, so that a fast track can be provided for the authorization and construction of these projects.

Interconnectivity of Markets is Key:

- There are considerable differences between SEE countries when it comes to adoption of RES in the energy mix and the ease of trading.
- SEE needs to work on further developing a common EU/SEE energy trading market based on free trade.

Map 6: Ranking of EU and UK Hubs Based on Monitoring Results – 2020



Source: ACER (10)

The BSTDB and Activities in Energy

BSTDB Members Countries

Overview of Greater Black Sea Region

Romania



Capital: Bucharest
Population: 21.4m
GDP: \$169bn
GDP per cap.: \$7,905

Moldova



Capital: Chisinau
Population: 3.6m
GDP: \$7.3bn
GDP per cap.: \$2,038

Ukraine



Capital: Kiev
Population: 45.6m
GDP: \$176bn
GDP per cap.: \$3,864

Black Sea Region

Population: 327m
GDP: \$3,594bn
Weighted av. GDP per cap.: \$10,979

Bulgaria



Capital: Sofia
Population: 7.3m
GDP: \$54.3bn
GDP per cap.: \$7,243

Albania



Capital: Tirana
Population: 3.2m
GDP: \$12.4bn
GDP per cap.: \$3,845

Russia



Capital: Moscow
Population: 143.1m
GDP: \$2,007bn
GDP per cap.: \$14,027

Georgia



Capital: Tbilisi
Population: 4.5m
GDP: \$15.8bn
GDP per cap.: \$3,520

Greece



Capital: Athens
Population: 11.4m
GDP: \$249bn
GDP per cap.: \$21,799

Turkey



Capital: Ankara
Population: 74.7m
GDP: \$789bn
GDP per cap.: \$10,561

Armenia



Capital: Yerevan
Population: 3.3m
GDP: \$9.9bn
GDP per cap.: \$3,027

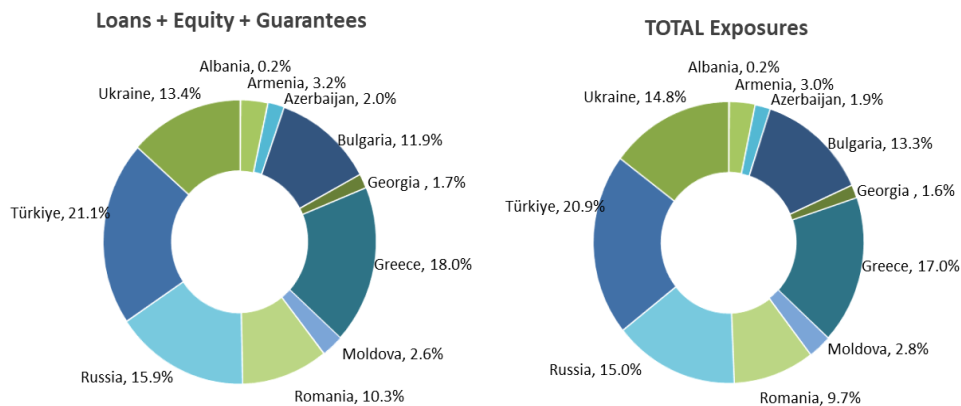
Azerbaijan



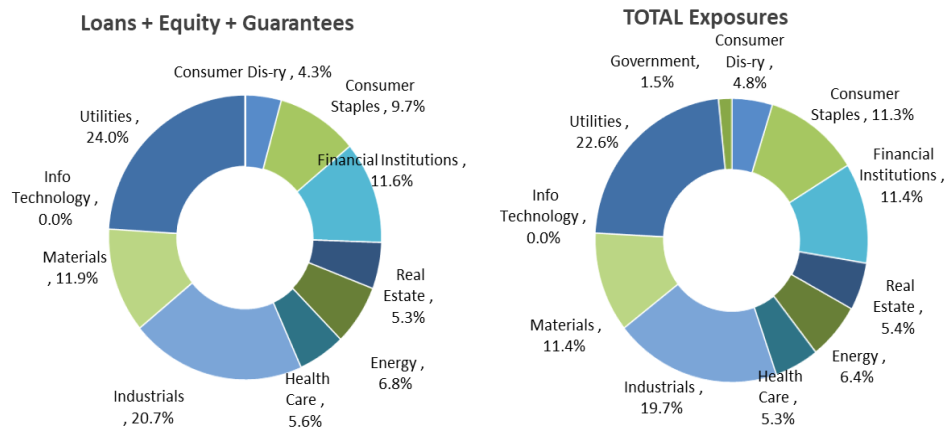
Capital: Baku
Population: 9.2m
GDP: \$68.7bn
GDP per cap.: \$7,442

Portfolio Across Countries and Sectors

Portfolio by Country



Portfolio by Sector



BSTDB Energy Portfolio



**Project
Cost**

**Total: EUR 450 m
BSTDB: EUR 50 m**

Borrower

Bulgarian Energy Holding

Term

5 years

Sector

Utilities

Summary

Participation in the tap issue of their June 2018 EUR 400m Eurobond issue. The funds will be used for their ongoing capital investment program.

EnergoPro (Bulgaria)



**Project
Cost**

**Total: EUR 370 m
BSTDB: EUR 42 m**

Borrower

EnergoPro

Term

5 years

Sector

Utilities

Summary

Participation in the primary bond issue as an anchor investor to finance the ongoing improvement and developments of the electricity grid and metering system and of the other markets of EnergoPro operations.

Energian Oil & Gas (Greece)



Project Cost	BSTDB: EUR 90m
Borrower	Energian Oil & Gas
Term	8 years
Sector	Natural Resources
Summary	Support the company's existing oil development programme to access additional oil reserves in the Prinos, Prinos North and Epsilon operating oil fields, located offshore Greece (Prinos-Kavala Basin).



Project Cost	Total: EUR 360 m BSTDB: EUR 50 m
Borrower	Eurohold
Term	5 years
Sector	Utilities
Summary	BSTDB participated in an investment regarding the acquisition of CEZ's assets in Bulgaria and/or refinancing of the existing debt.

ENERGOPLAN SA

Project Cost	up to EUR 8m
Borrower	Energoplan
Term	5 years
Sector	Utilities
Summary	Unfunded Risk Guarantees on behalf of the company to RAE the energy licensor.

Gurmat Geothermal Power Plant (Turkey)

Project Cost	BSTDB: USD 1b
Borrower	Gurmat Electric Uretim
Term	15 years
Sector	Energy
Summary	Financing of the construction and operation of 170MW geothermal power plant southwestern Turkey



Galnaftogaz (Ukraine)



Project Cost	Total: USD 220 m BSTDB: USD 20 m
Borrower	Concern Galnaftogaz
Term	7 years
Sector	Utilities
Summary	CAPEX program and expansion of the Borrower's gas filling stations network in Ukraine

Ingulets Solar PV (Ukraine)



**Project
Cost**

**Total: EUR 56 m
BSTDB: EUR 19.5 m**

Borrower

Ingulets Solar PV

Term

10 years

Sector

Renewable Energy

Summary

Development, construction and operation of an up to 58 MW solar power plant project Ingulets, to be located in the Mykolvyiv region in Southern part of Ukraine.



Public Power Corporation S.A.-Hellas
Always by your side

Project Cost	Total: EUR 1.7 b BSTDB: EUR 160 m
Beneficiary	PPC
Term	5 years
Sector	Energy / Utility
Summary	Corporate Loan for financing PPC's capital expenditure program for the period 2019-2020 which is expected for its electricity distribution networks.



RENGY DEVELOPMENT



Scatec Solar
Improving our future™

**Project
Cost**

**Total: EUR 53 m
BSTDB: EUR 18.5 m**

Borrower

Rengy Bioenergy Solar PV

Term

10 Years

Sector

Renewable Energy

Summary

Development, construction and operation of three solar parks of total capacity of 47 MW: (i) Afanasievka of 14 MW, (ii) Taborovka of 16 MW and (iii) Tokarivka of 17 MW, located in the Mykolaiv region in Southern part of Ukraine

Syvash Wind (Ukraine)



**Project
Cost**

**Total: EUR 390 m
BSTDB: EUR 30 m**

Borrower

Syvash Wind

Term

10 year

Sector

Renewable Energy

Summary

Development, construction and operation of the wind park of total capacity of 250 MW, to be located in the Kherson region in Southern part of Ukraine

Thank you

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