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South East European Energy Challenges and Opportunities

Regional Energy Balances & a Case Study for Prosumers and RES

Assoc. Prof. Atanas Georgiev, PhD

Vice-Dean, Faculty of Economics and Business Administration

Sofia University “St. Kliment Ohridski”, Bulgaria

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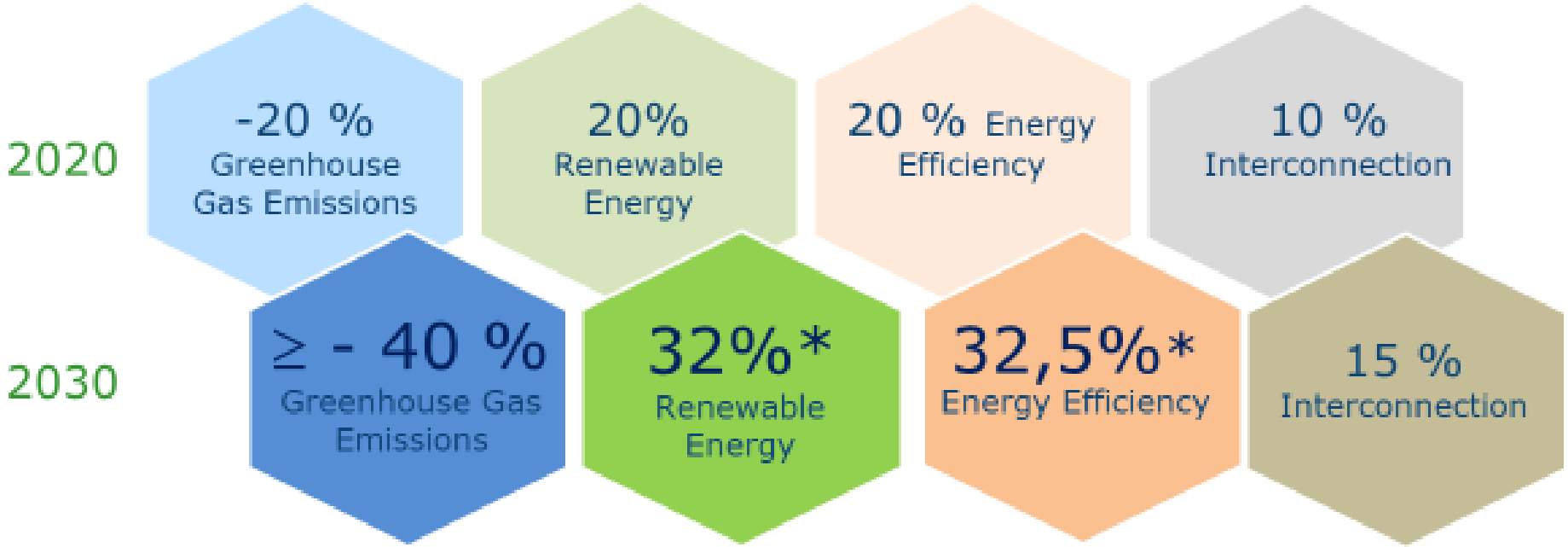
General 2030 SEE Challenges

- Climate Policy:
  - National COP21 pledges – and cancellations?
  - Integrated National Energy and Climate Plans for 2030 (EU);
- Energy Policy:
  - Lignite TPP – short- and medium-term future;
  - Nuclear projects?
  - Gas security of supply;
  - Need for new RES (goals);
  - Grid development;
  - Energy efficiency;
  - Energy poverty

Agreed headline targets 2030 Framework for Energy and Climate – Politically Agreed by Parliament & Council



European Commission

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Clean energy for all Europeans package - legislative process

	European Commission Proposal	**EU Inter-institutional** Negotiations	**European Parliament** Adoption	**Council** Adoption	**Official Journal** Publication
Energy Performance in Buildings	**30/11/2016**	**Political Agreement**	**17/04/2018**	**14/05/2018**	**19/06/2018 - Directive (EU) 2018/844**
Renewable Energy	**30/11/2016**	**Political Agreement**	**13/11/2018**	**04/12/2018**	**21/12/2018 - Directive (EU) 2018/2001**
Energy Efficiency	**30/11/2016**	**Political Agreement**	**13/11/2018**	**04/12/2018**	**21/12/2018 - Directive (EU) 2018/2002**
Governance of the Energy Union	**30/11/2016**	**Political Agreement**	**13/11/2018**	**04/12/2018**	**21/12/2018 - Regulation (EU) 2018/1999**
Electricity Regulation	**30/11/2016**	**Political Agreement**	**26/03/2019**	**22/05/2019**	**14/06/2019 - Regulation (EU) 2019/943**
Electricity Directive	**30/11/2016**	**Political Agreement**	**26/03/2019**	**22/05/2019**	**14/06/2019 - Directive (EU) 2019/944**
Risk Preparedness	**30/11/2016**	**Political Agreement**	**26/03/2019**	**22/05/2019**	**14/06/2019 - Regulation (EU) 2019/941**
ACER	**30/11/2016**	**Political Agreement**	**26/03/2019**	**22/05/2019**	**14/06/2019 - Regulation (EU) 2019/942**

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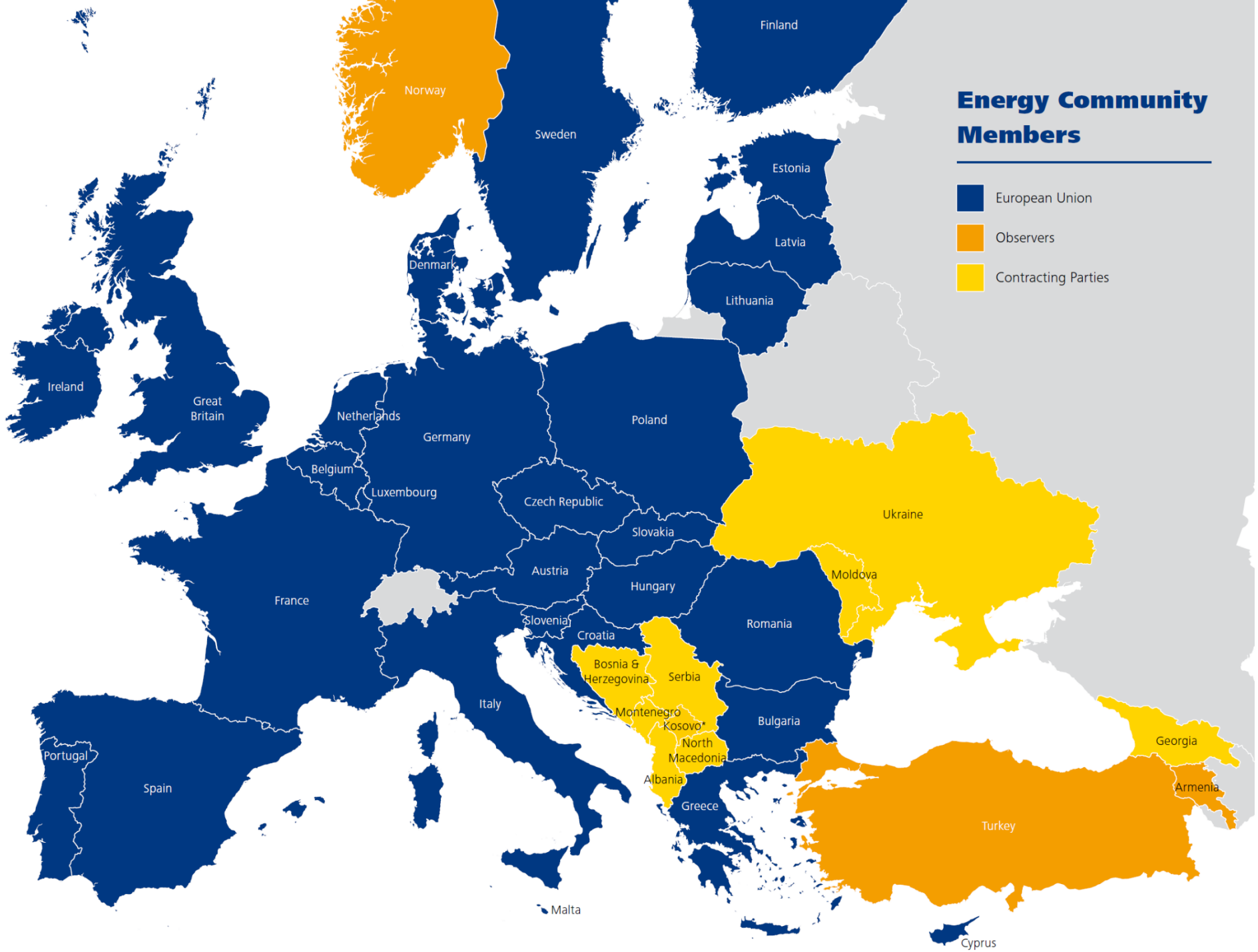

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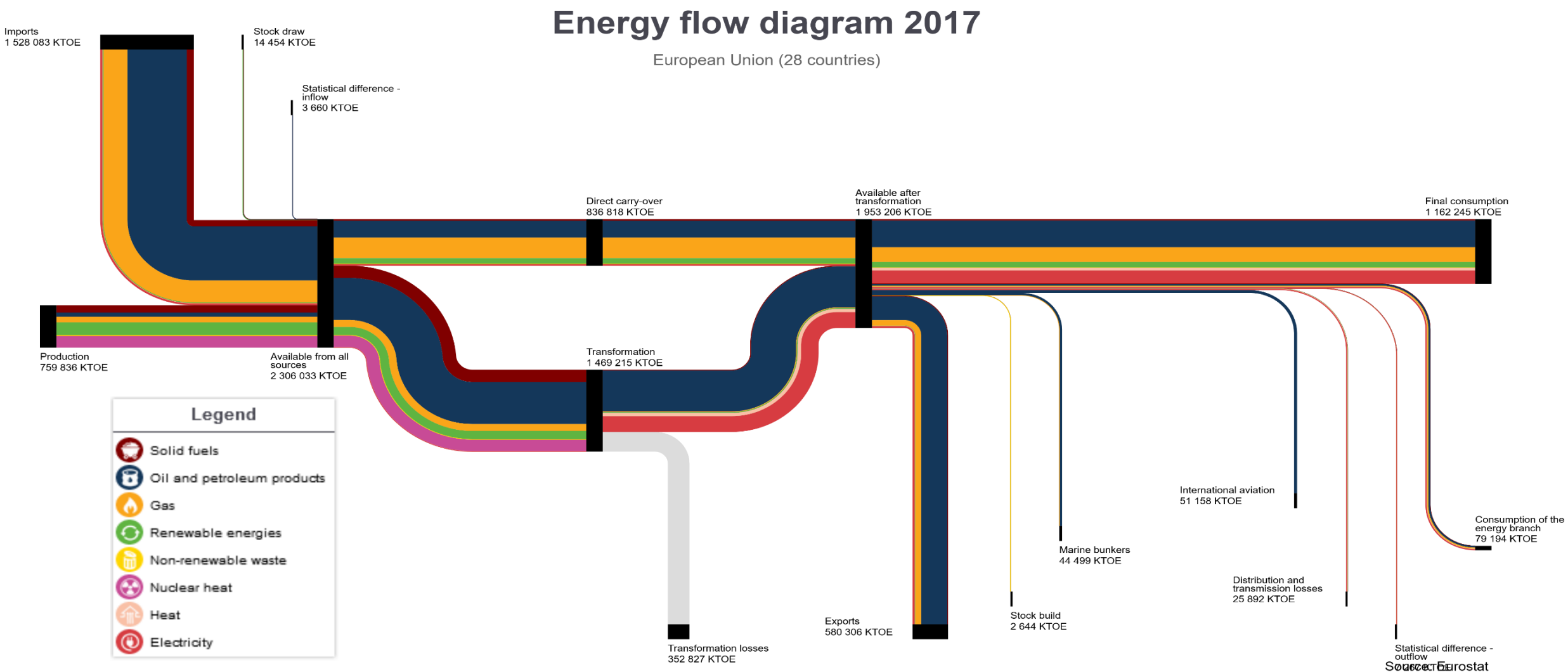
The Current Energy Balances (Primary)



Source: Eurostat

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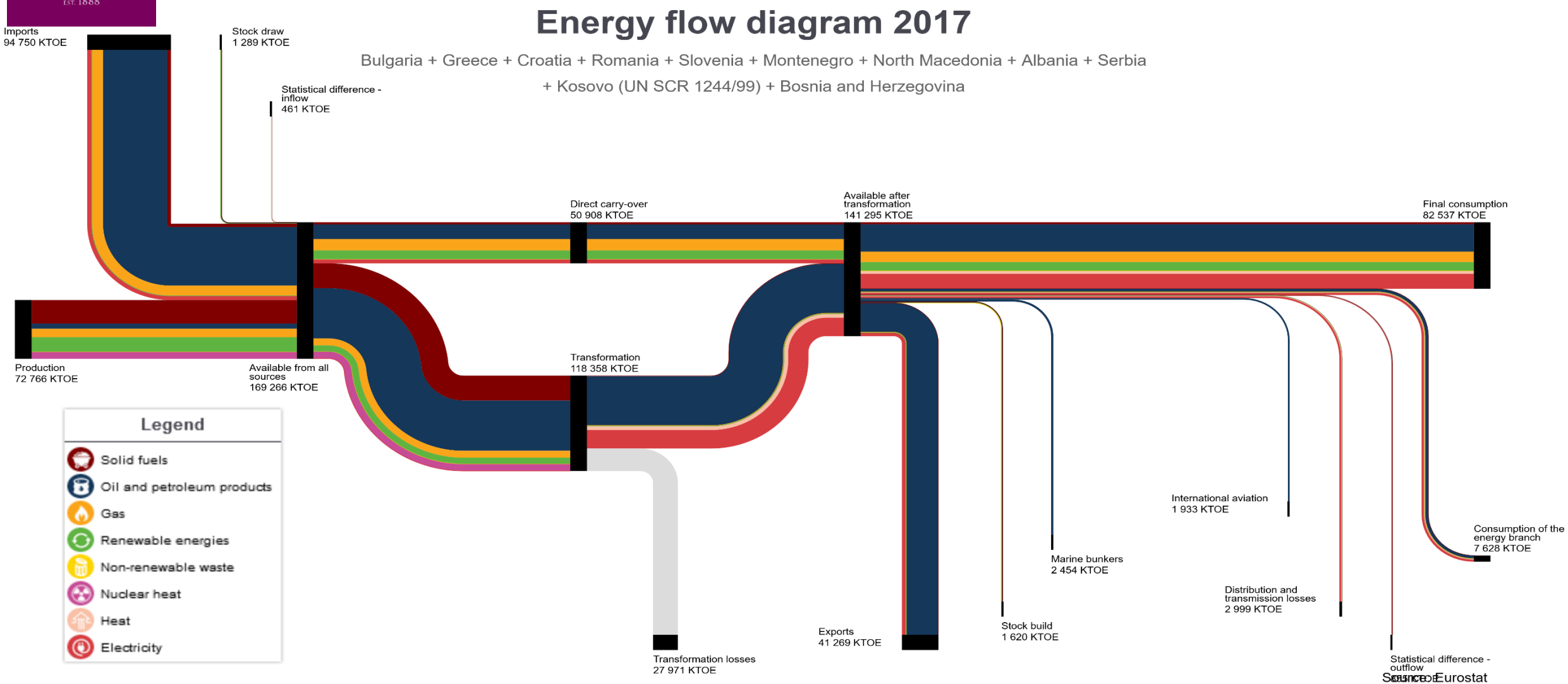
Energy Balances in SEE



Source: Eurostat

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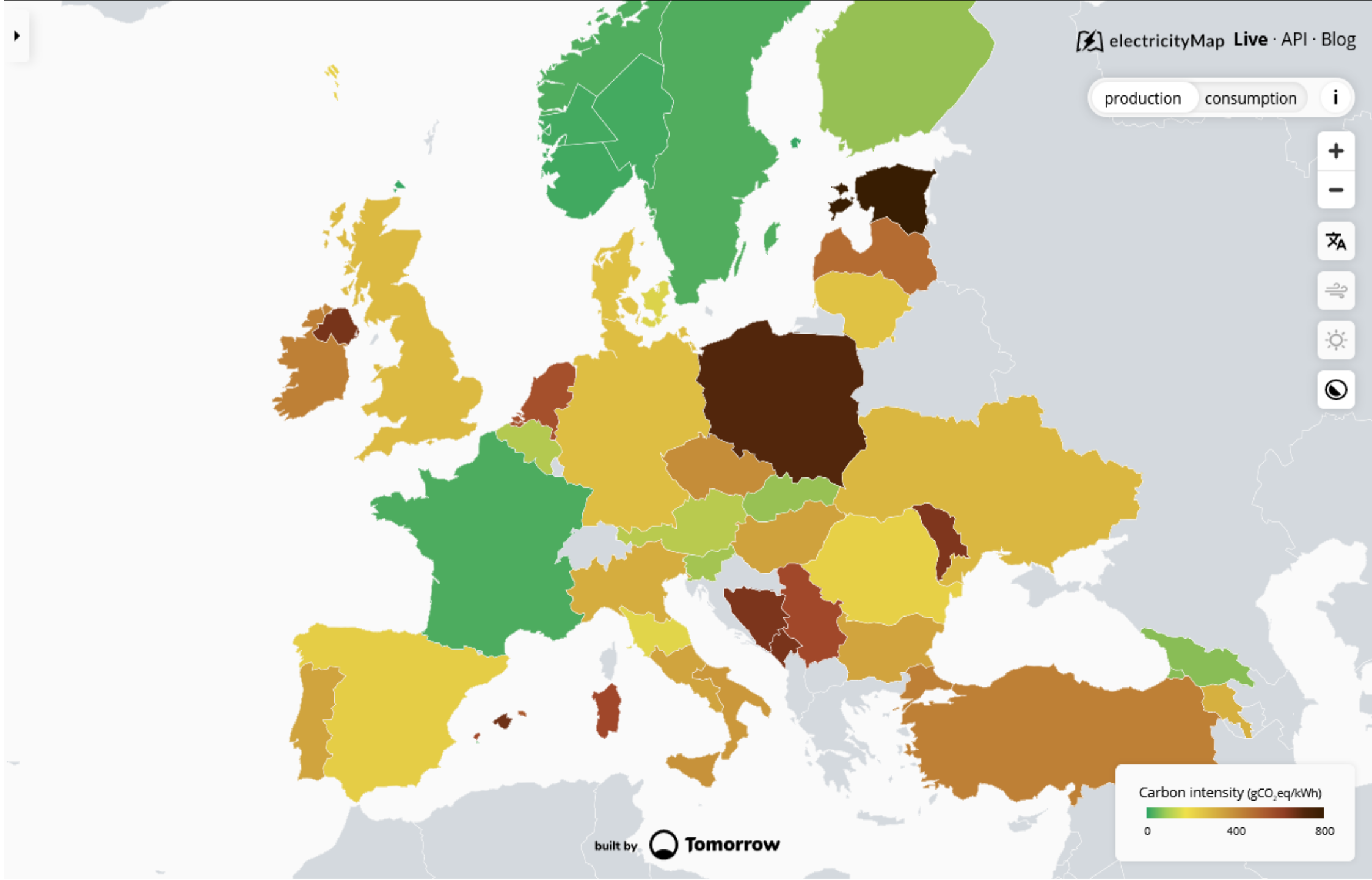

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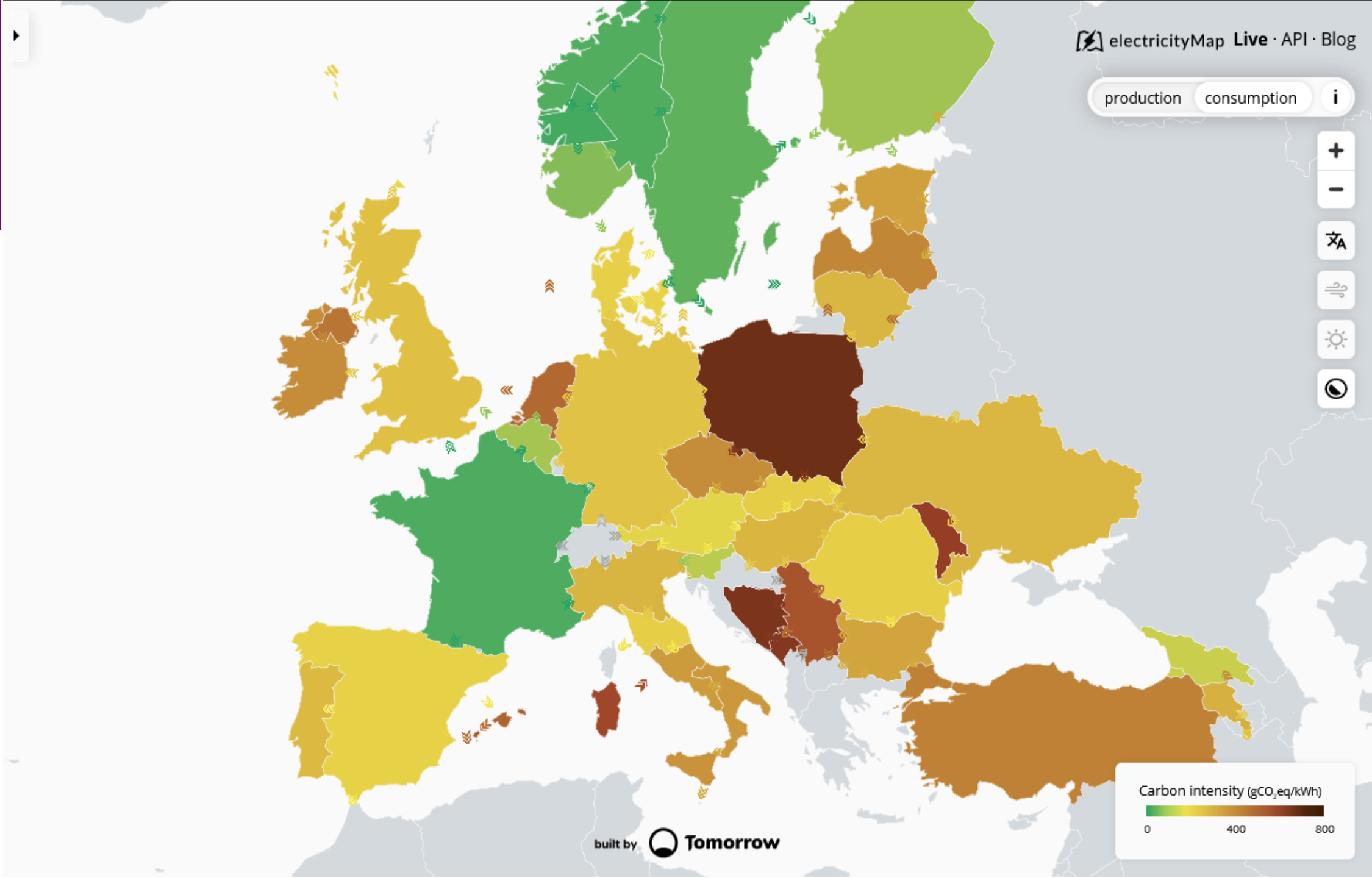

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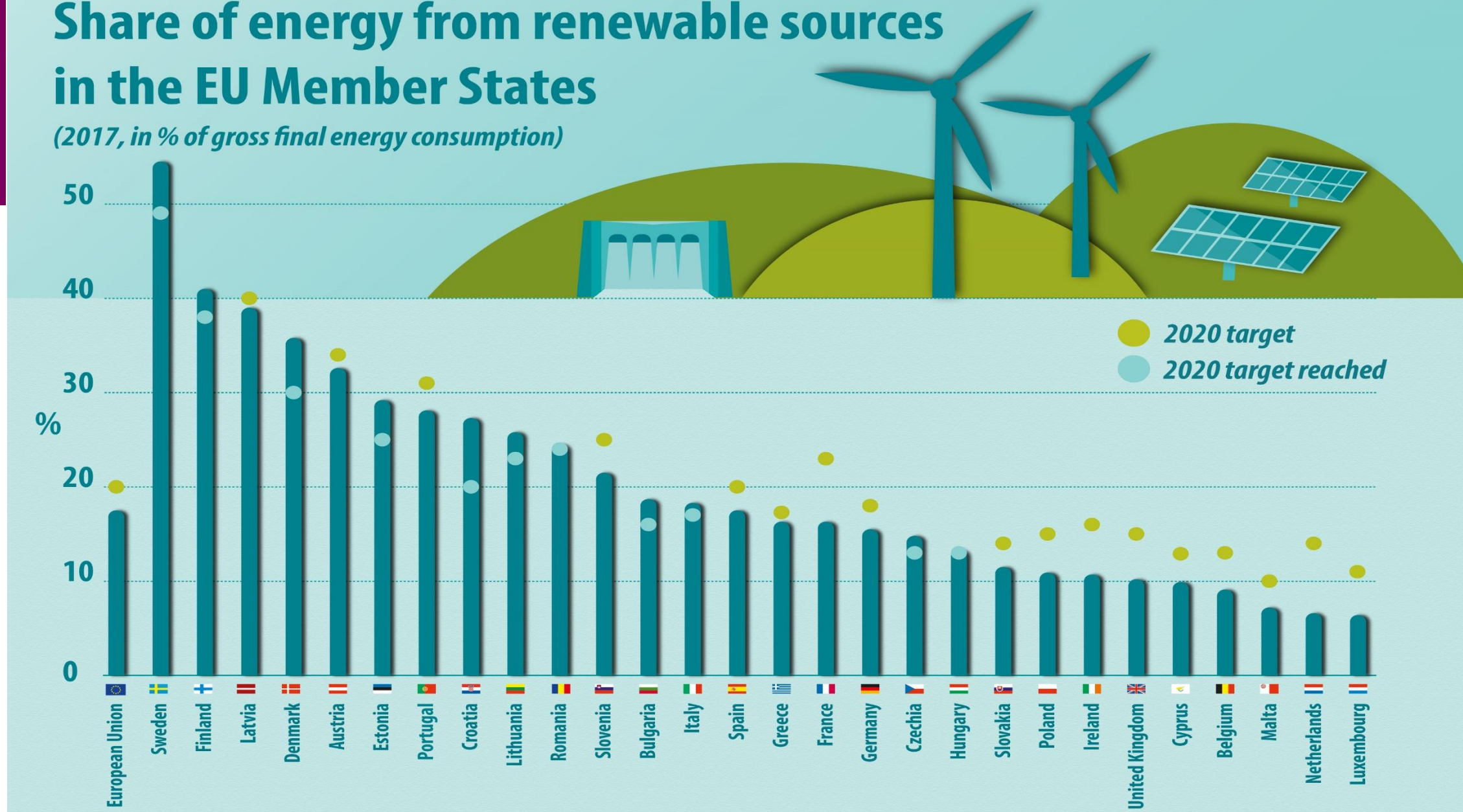
Share of energy from renewable sources in the EU Member States

(2017, in % of gross final energy consumption)



ec.europa.eu/**eurostat**

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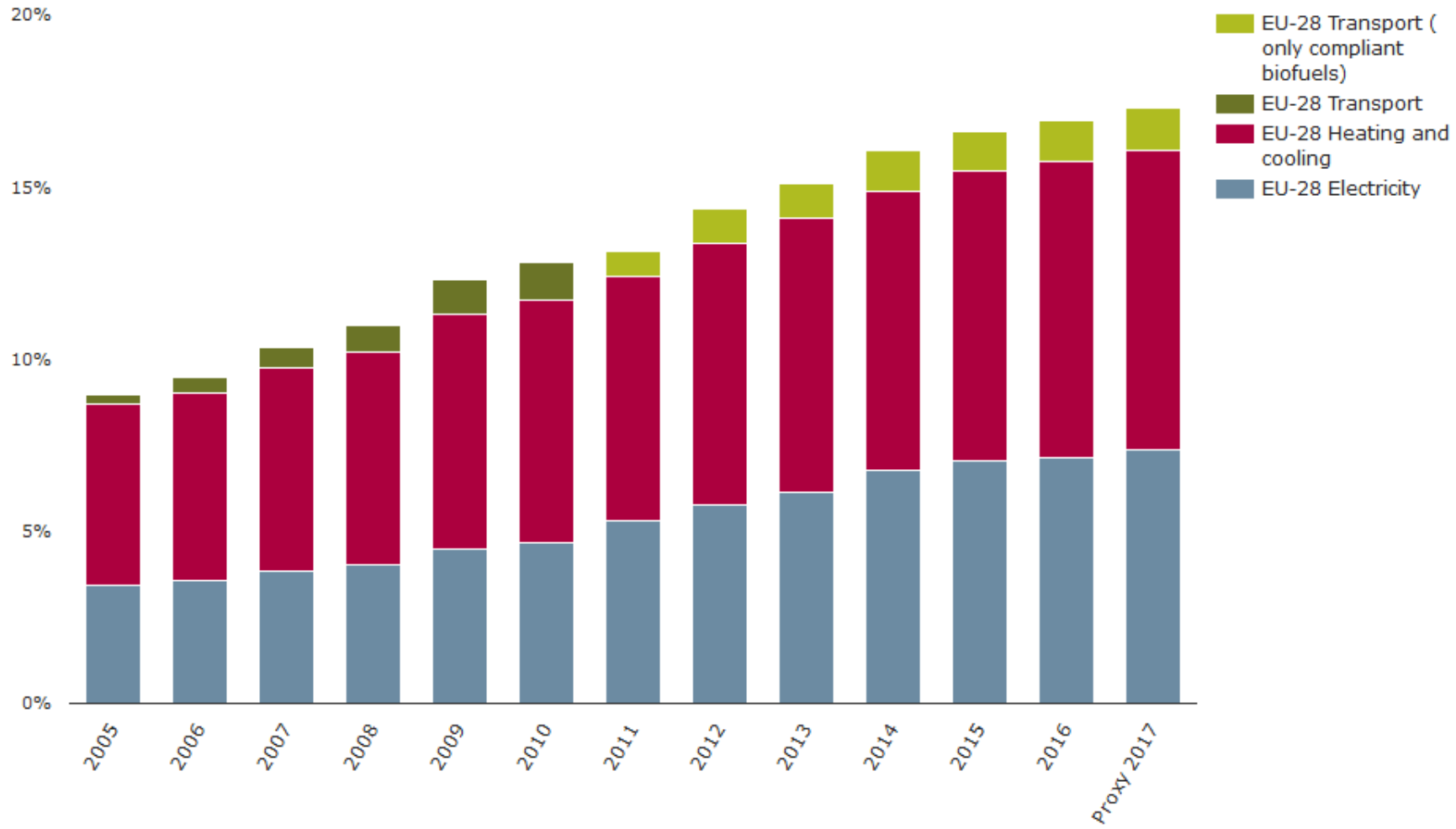
EU-28

Chart — Share of renewable energy in gross final energy consumption



Source: European Environment Agency (2019) Share of renewable energy in gross final energy consumption

Notes:
The share of renewable energy sources in transport (RES-T) and the cumulative share of renewable energy sources (RESs) take into account all biofuels consumed in transport between 2005 and 2010, and only biofuels complying with the Renewable Energy Directive (RED) sustainability criteria for the years from 2011.

Proxy 2017 data are preliminary estimates from the European Environment Agency (EEA).

Do We Know Our RES (H&C)?

- In absolute terms, **RES-H&C (heating & cooling)** remains the dominant RES market sector in Europe.
- Final energy consumption of **solid biomass** represented **83% of total RES-H&C**.
- At the EU level, renewables made up almost one fifth of all gross final energy consumed for heating and cooling (19.1 % in 2016; 19.3 % in 2017, according to EEA estimates).
- The sector grew by 4 % each year, on average, over the period 2005-2016 a growth rate that must be maintained if NREAP expectations for 2020 are to be realised.
- In 16 Member States, RES-H&C represented **over half of the national gross final consumption of renewables in 2016** (in Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Greece, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia and Sweden).
- Since 2005, despite biogas and heat pumps having the fastest compound annual growth rates, **solid biomass-based technologies prevailed in this market sector**.

Source: European Environment Agency (2019) Share of renewable energy in gross final energy consumption

Do We Know Our RES (E)?

- **Hydropower** was the greatest contributor to RES-E in the EU in 2016, representing **36% of total RES-E (Electricity) production** (2 percentage points less than in 2015). However, the relative importance of hydropower has decreased substantially since 2005, when it generated 70 % of RES-E, because wind and solar energy have developed rapidly over this period.
- Wind accounted for 32 % of RES-E (1 percentage point more than the previous year), compared with only 14 % in 2005.
- Solar energy accounted for 12 % of RES-E, compared with 0.3 % in 2005.
- **Solid biofuels** accounted for 10 % of RES-E, compared with 11 % in 2005.
- All other renewables accounted for 10 % of RES-E, compared with 4 % in 2005.
- There was a large variation in the share of RES-E between countries in Europe: from 5.6 % in Malta and 6.7 % in Luxembourg, to 72.6 % and 64.9 % in Austria and Sweden, respectively. This reflects, among other things, different starting points in the deployment of renewables in each country, differences in the physical capacity to produce renewable energy and, to a lesser extent, differences in policies to stimulate renewables.

Source: European Environment Agency (2019) Share of renewable energy in gross final energy consumption

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Do We Know Our RES (T)?

- The total consumption of biofuels in transport reached 13.8 million tonnes of oil equivalent (Mtoe), of which 13.6 Mtoe was reported as compliant with the sustainability criteria under RED.
- The 2016 figure of a 7.1 % share of RES-T (Transport) in the EU is higher than the 2003 Biofuels Directive target of reaching a share of 5.75 % by 2010 [2].

Source: European Environment Agency (2019) Share of renewable energy in gross final energy consumption

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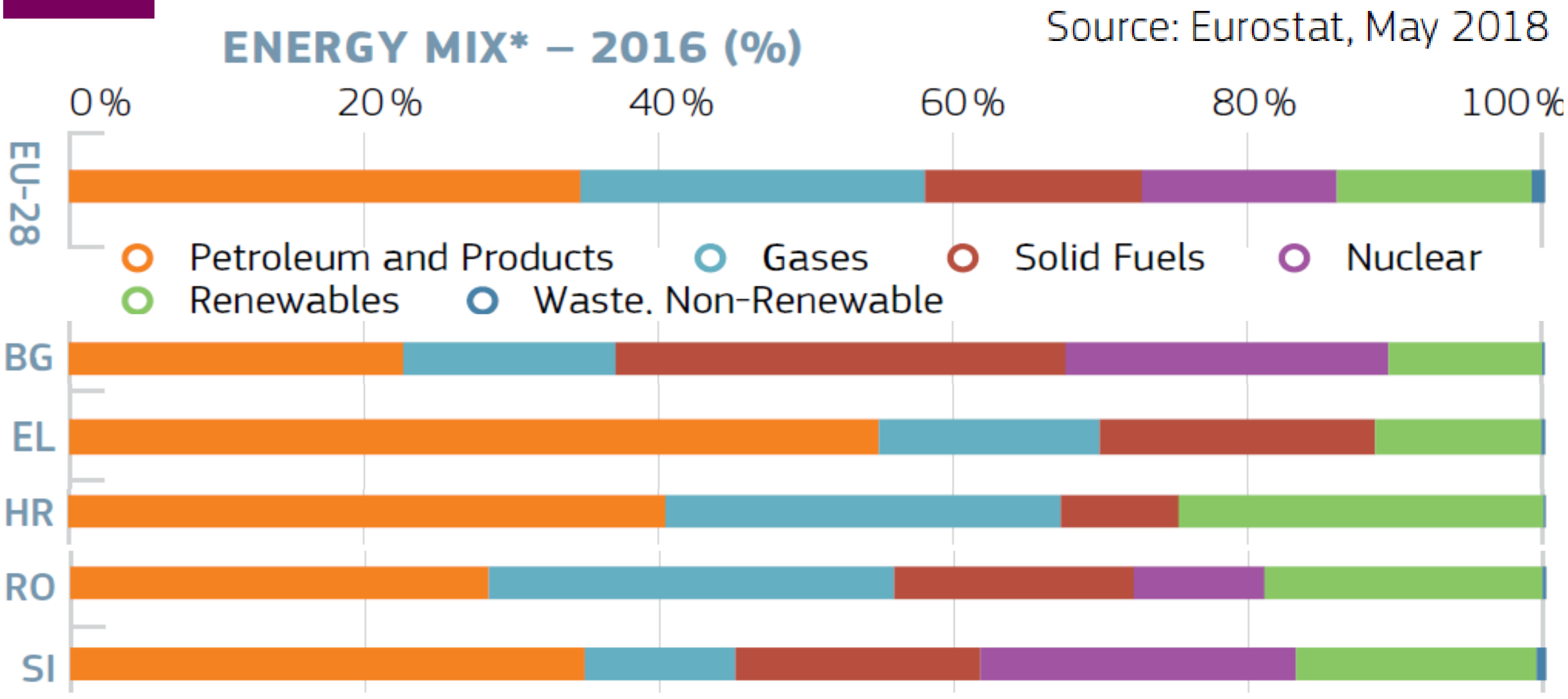
Energy Mix in Some EU members (SEE)



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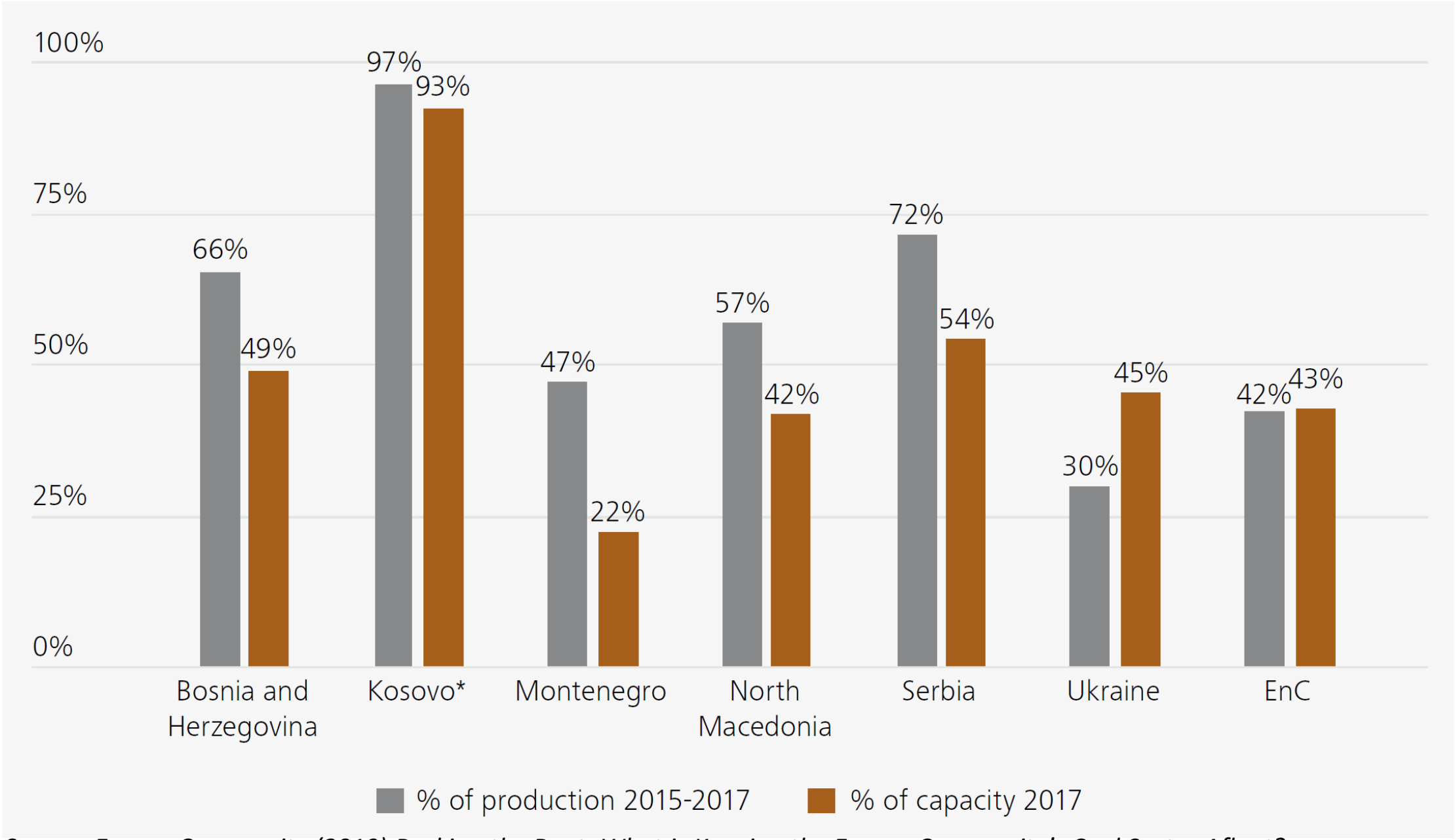
Graph 2: Share of electricity from coal in the generation fuel mix



Source: Energy Community (2019) Rocking the Boat: What is Keeping the Energy Community's Coal Sector Afloat?

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Energy Community Members - Subsidies

Table 1: Amount of state support to production of electricity from renewables and coal

in '000 eur

Contracting Party	Paid incentives for production from renewables			Paid direct subsidies for production from coal		
	2015	2016	2017	2015	2016	2017
Bosnia and Herzegovina	17.595	20.160	25.040	26.189	35.550	48.245
Kosovo*	1.630	7.670	5.560	30.894	8.768	7.501
Montenegro	960	3.960	4.100	881	1.156	700
North Macedonia	15.462	20.526	20.085	4.379	3.722	2.927
Serbia	17.170	24.470	34.800	90.746	115.751	80.606
Ukraine	151.490	n/a	212.170	194.732	263.399	280.442

Source: Energy Community (2019) Rocking the Boat: What is Keeping the Energy Community's Coal Sector Afloat?

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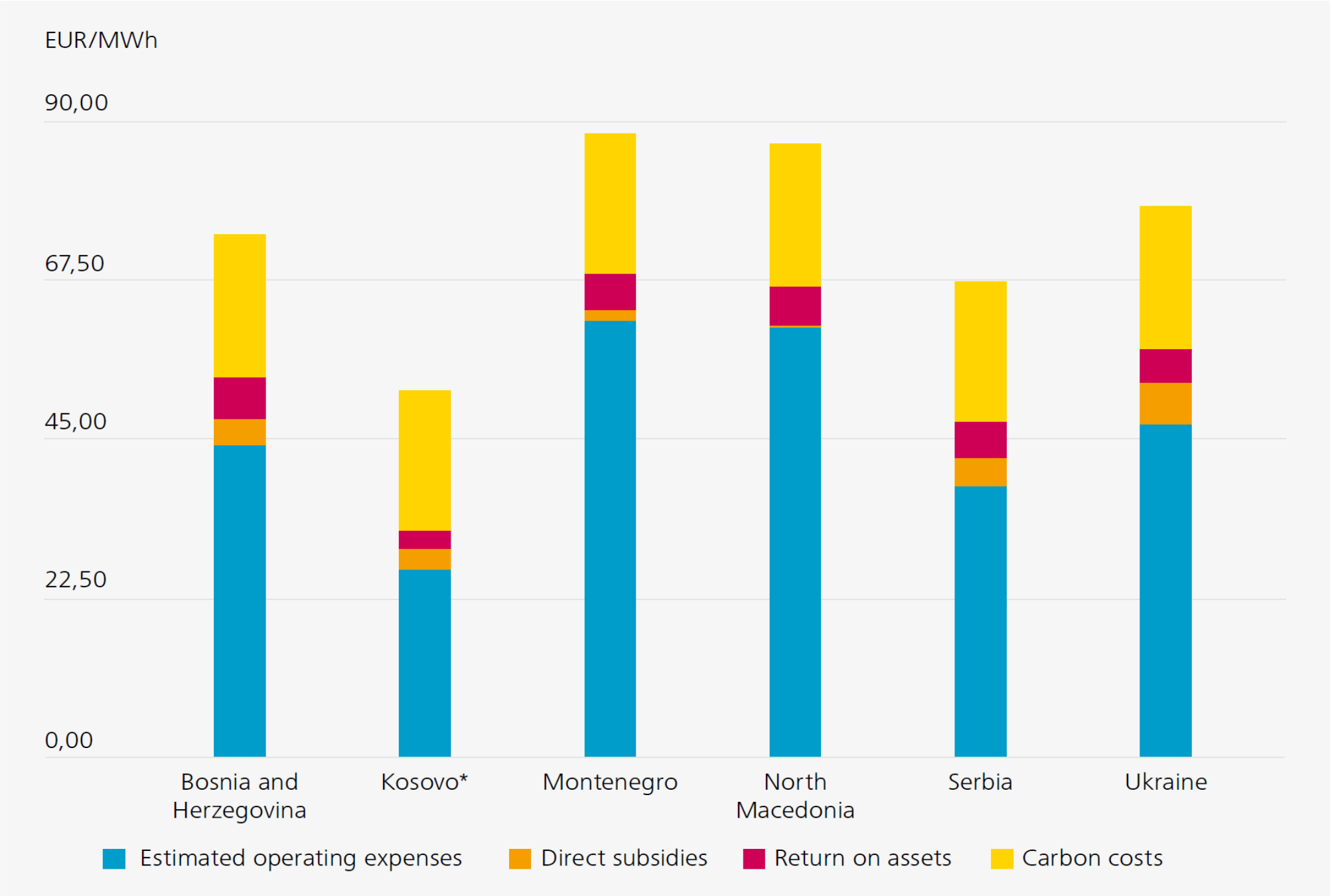
Graph 1: Estimation of full costs of production of electricity from coal



Source: Energy Community (2019) Rocking the Boat: What is Keeping the Energy Community's Coal Sector Afloat?

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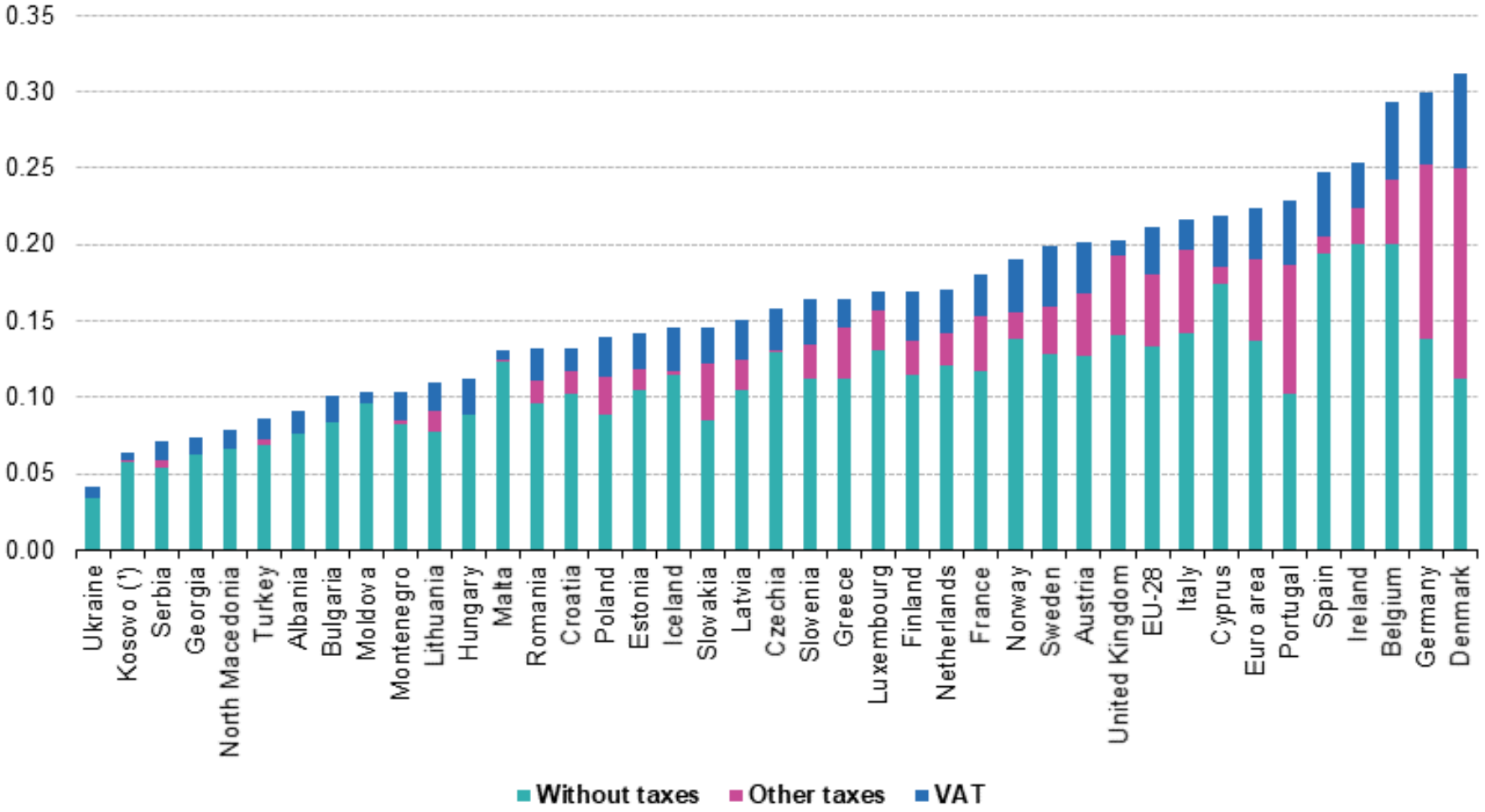
Electricity prices for household consumers, second half 2018

(EUR per kWh)



(') This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data codes: nrg_pc_204)

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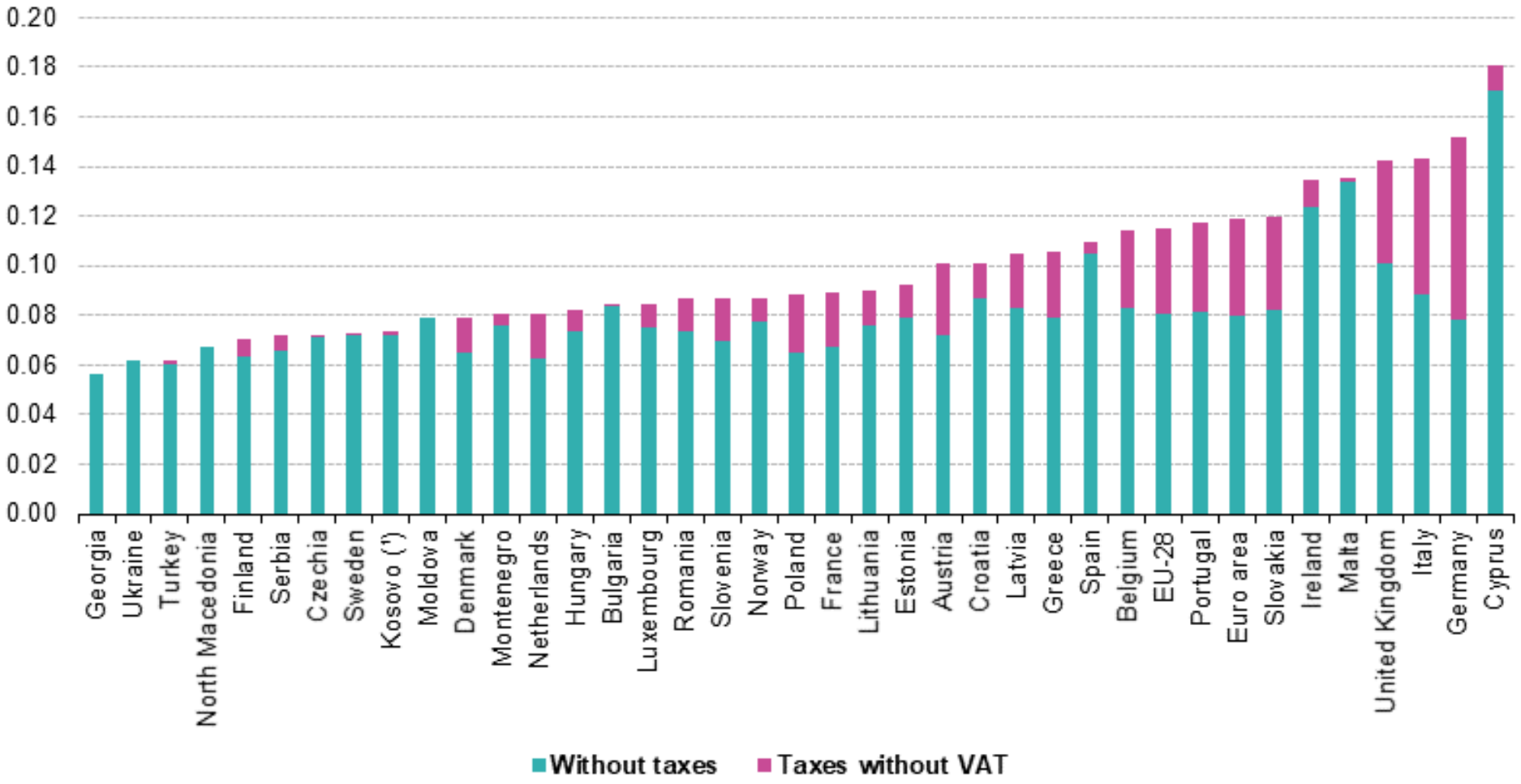
Electricity prices for non-household consumers, second half 2018

(EUR per kWh)



(*) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data codes: nrg_pc_205)

eurostat

A Case Study from Bulgaria

- 2018, Center for the Study of Democracy (link):
  - Martin Vladimirov, CSD
  - Atanas Georgiev, Sofia University
  - Svetla Kolarova, CSD
- The report explores the potential and the obstacles before the decentralization of electricity supply in Bulgaria

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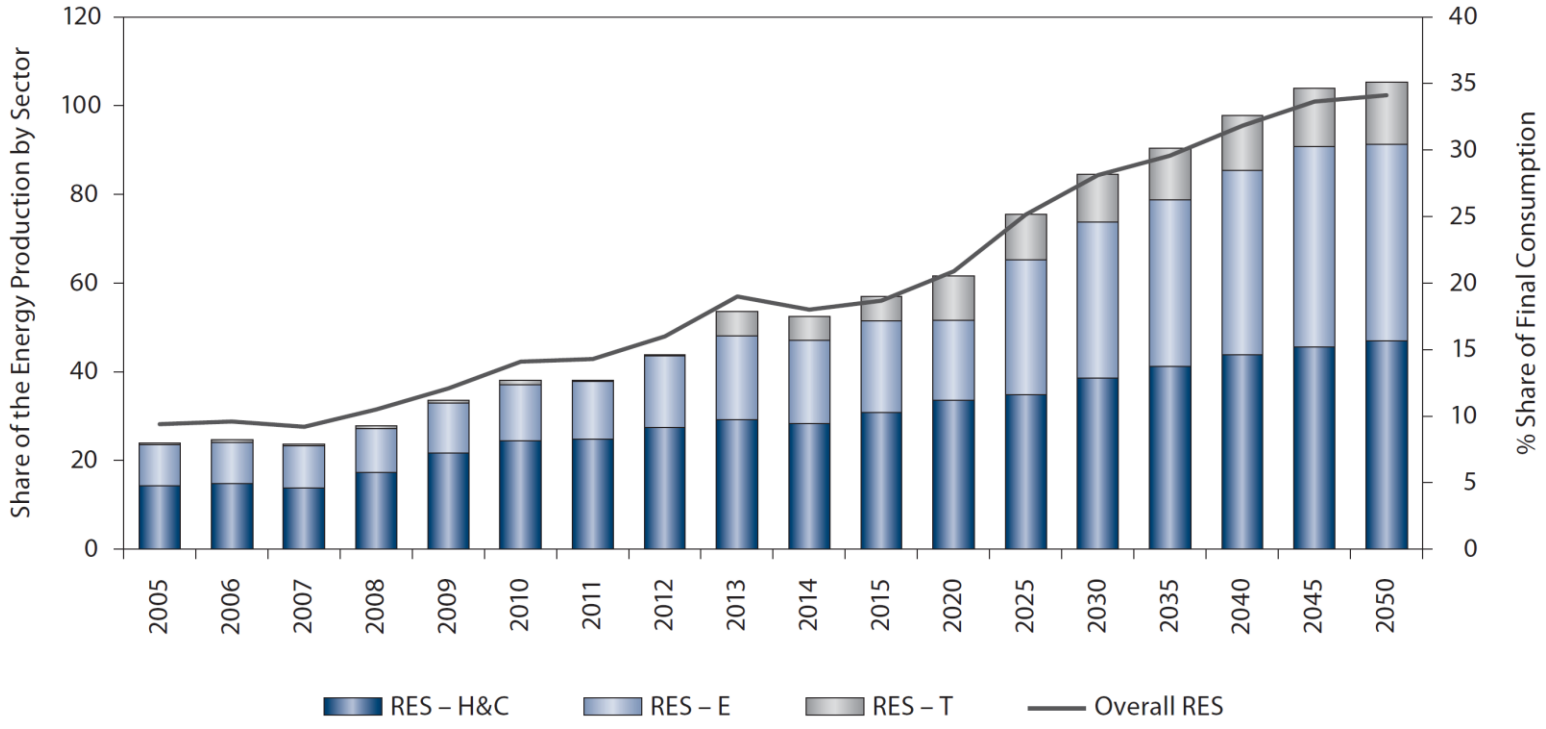
Bulgaria's RES Sector

- Bulgaria is on track to reach its renewable energy target for 2020.
- Bulgaria also met the 2013/2014 and 2015/2016 intermediate goals as set under the Renewable Energy Directive of the EU.
- The 2016 share of renewable energy sources in the gross final energy consumption stands at 18.8 %, well above the 16 % target



Source: *National Statistical Institute; Projections from the PRIMES Model.*[13]

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Large vs. Small RES

Type	Capacity	#	Total Capacity
Wind	>3 MW	63	568 MW*
PV Solar	>3 MW	109	646 MW*

* Top 10 total capacity:
- Wind – 379 MW
- PV Solar – 223 MW

Source: Sustainable Energy Development Agency (SEDA), Guarantees of Origin Register (2018)

Meanwhile, in Germany:

- Top-10 PV Solar have a total capacity of 1 GWp (or 2.5%) of all the PV Solar capacities – 38 GWp (2018);
- Over 98% of the 1.5 million PV Solar capacities are connected to the DSO low-voltage grids;
- Only 15% of the total PV Solar capacity have a single capacity >1 MWp

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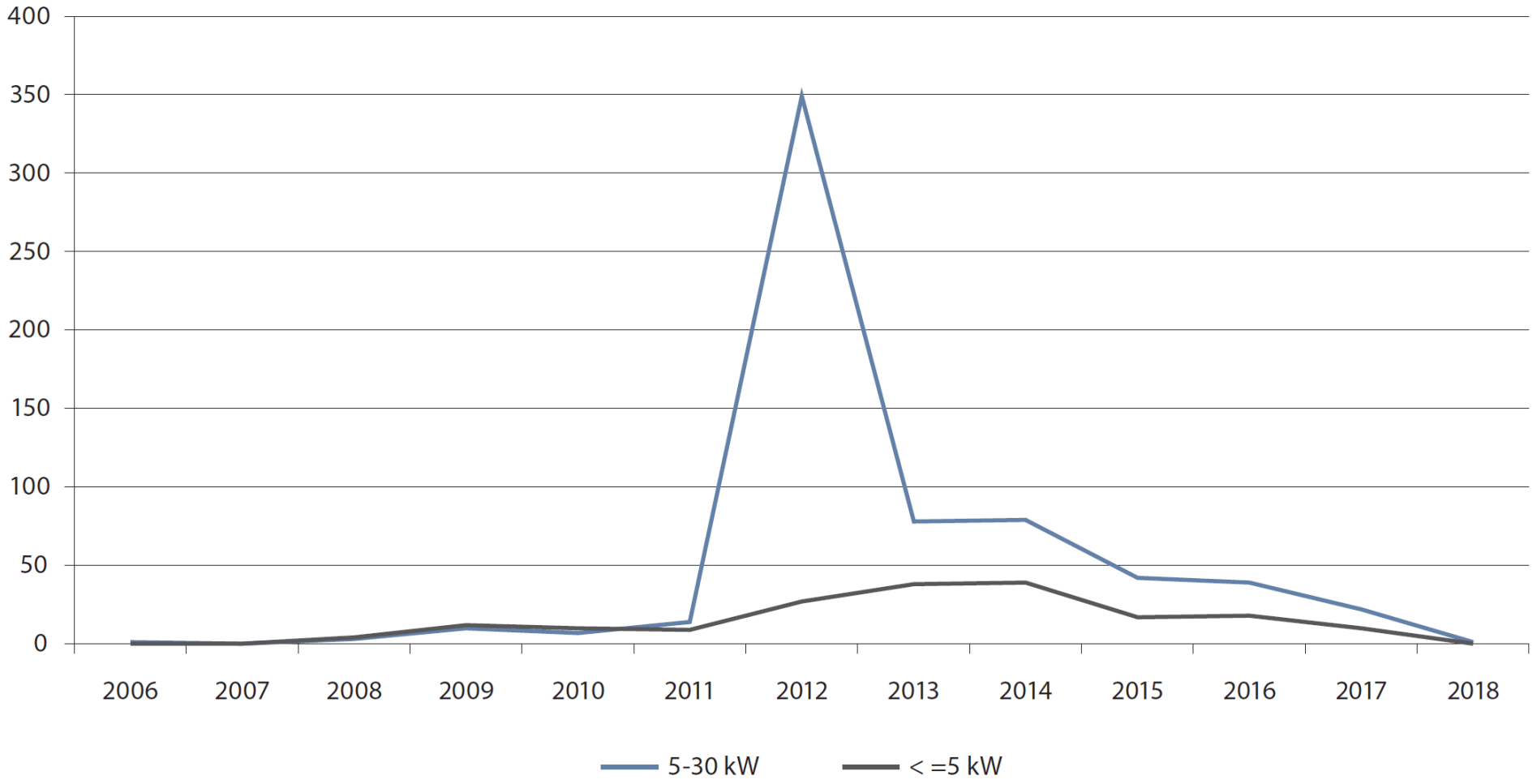
of New RES with Capacity < 30 kW



Source: *Sustainable Energy Development Agency (SEDA).*

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Stage	Timeframe (business days)	Cost
1. DSO evaluation of the conditions of grid connection and eligibility approval[55]	30-45 days	EUR 35-50
2. Installation company prepares eligibility opinions from an electrical engineer	7 days	EUR 25 (depending on the DSO) for evaluation of the opinions
3. Approval of the construction project and issue of a construc-tion permit by the municipality	7-14 days	Fee is determined by municipalities on the basis of Category 6 construction, may vary
4. Construction of the RES facility	7-14 days	A 5-kW photovoltaic installation costs between EUR 5,000 and 7,000; investment in a 30-kW facility could reach above EUR 25,000
End of administrative and construction process for self-consumption; steps below for prosumption		
5. Final grid connection agreement with the DSO	7-30 days	N/A
6. Connection to the grid and 72-hour testing period	7 days (with the application and scheduling process)	EUR 25 for testing Up to EUR 375 for connection
7. Power purchase and balancing agreement with the DSO	7 days	N/A
Total	72-126 days	EUR 7,000-8,000 for PV below 5 kW EUR 27,000-28,000 for PV of 30 kW

Local Challenges in Bulgaria

Administrative

- RES-connection procedures are not streamlined;
- Local municipalities and different DSOs have different procedures and requirements.

Regulatory

- Price signals for consumers/prosumers;
- The only existing incentives are for large-scale RES.

Economic

- Energy poverty / General poverty;
- Lack of proper financial instruments.

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Key Findings of the Case Study

- The investment in large RES projects practically **stopped after 2012** (with the exception of some biomass plants);
- The development of small RES, **close to consumption**, has not taken off and without proper incentives could not be improved;
- **The 2030 targets** on a EU level are now set at 32 % share of RES in the energy mix, and the current approach of Bulgaria could not ensure the achievements of the new goals;
- **The potential** for small RES is large, according to data from the SEERMAP project;
- One of the overarching legal challenges is that the laws do not distinguish between small and large RES producers, thus giving advantage to multimillion investments in **utility-scale** RES capacities;
- There are no specific provisions in the national legislation for **prosumers** or energy **cooperatives**;
- The economics of small RES investments is negatively affected by the **existing cross-subsidies** in the regulated electricity sector, which still make consumption from the grid way more attractive than the investment in own generation.

Policy Recommendations (1/2)

- Amending the legislation in order to allow and promote installation of small RES at end consumers' locations through one-stop shops and diminished administrative burden;
- Creation of one-stop shops at municipalities for streamlining all administrative procedures;
- Development of special programs for subsidised construction of small-scale RES;
- Changing the regulatory cost model for the distribution grids so that the prices for access to the grid are not dependent on the quantity consumed;
- Removing all the remaining cross-subsidies in the electricity sector in order to send the right price signals to all market participants;
- Reconsidering large-scale, government-sponsored energy projects and comparing the expected costs for the final consumers with the costs of electricity produced from small RES;

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Policy Recommendations (2/2)

- Simplifying 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;
- Changing the focus of the RES policies from electricity-only to heating and cooling as well;
- Increasing the regulatory monitoring and control toward the DSOs in order to allow for less rejections of small RES connections;
- Ensuring the inclusion of all RES in a transparent, non-discriminatory national electricity market;
- RES capacity increases would depend on de-risking the investment environment for private actors by removing arbitrary taxes on revenues and easing the issuing of operational and construction licenses.

Assoc. Prof. Atanas Georgiev, PhD

Vice-Dean, Faculty of Economics and Business Administration

Sofia University “St. Kliment Ohridski”, Bulgaria

ageorgiev@feb.uni-sofia.bg

https://bit.ly/energy-markets-su