SEERMAP

South-East Europe Electricity Roadmap

RES-E policy and planning in Bulgaria

Regulatory and Governance Inconsistency

CENTER FOR THE STUDY OF DEMOCRACY

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Rumen Rusev
Sofia, 18 January

1. RES-E support scheme

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- Bulgaria held a significant RES potential already before the RES Directive – e.g. 2700 MW HPPs (1/4 of the total).
- RES Target – 16% of final gross consumption – already achieved in 2014
- The achievement of the target is questionable due to the methodology used
- RES-E Target – Almost Achieved in 2015 (20.8%)
- RES-E support based on feed-in tariffs under long-term contracts and EU Regional and Rural Development Funds:
  - ✓ 20 years for geothermal, solar PV and biomass
  - ✓ 12 years for wind power
  - ✓ 15 years for small HPPs until 10 MW
- Mandatory purchase was guaranteed until 1 January 2014 when hourly limitation was imposed
- IRR has been limited to WACC – 9% in 2011 down to 7% in 2014
- Compensation Mechanism:
  - ✓ Revenue from the sale of CO2 certicates
  - ✓ SRT imposed on participants on the free market
  - ✓ Surcharge include in regulated tariffs

National Action Plan for RES – Dec. 2012

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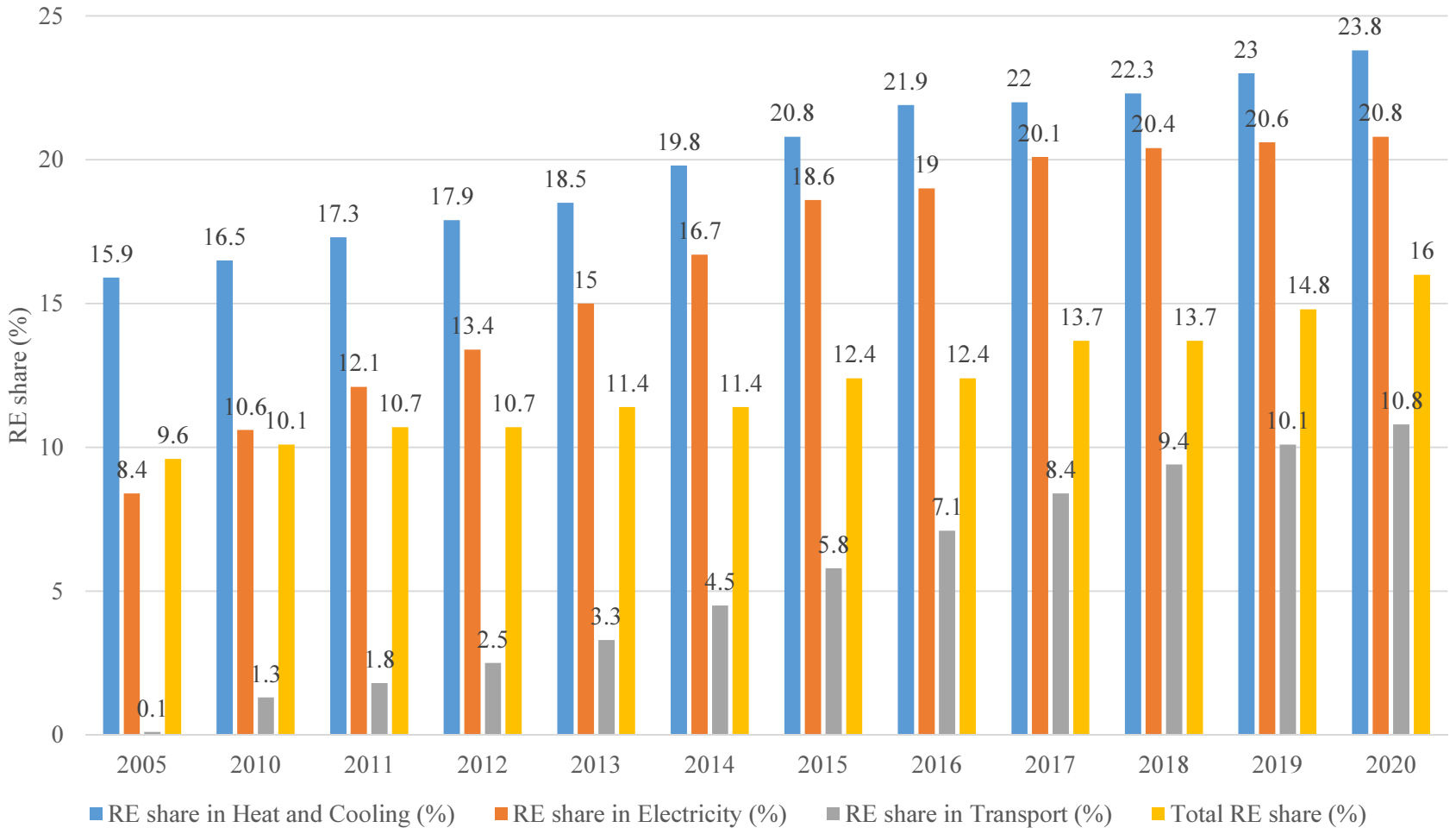

Source: Ministry of Energy, NAP RES

RES – Gross Consumption by Source

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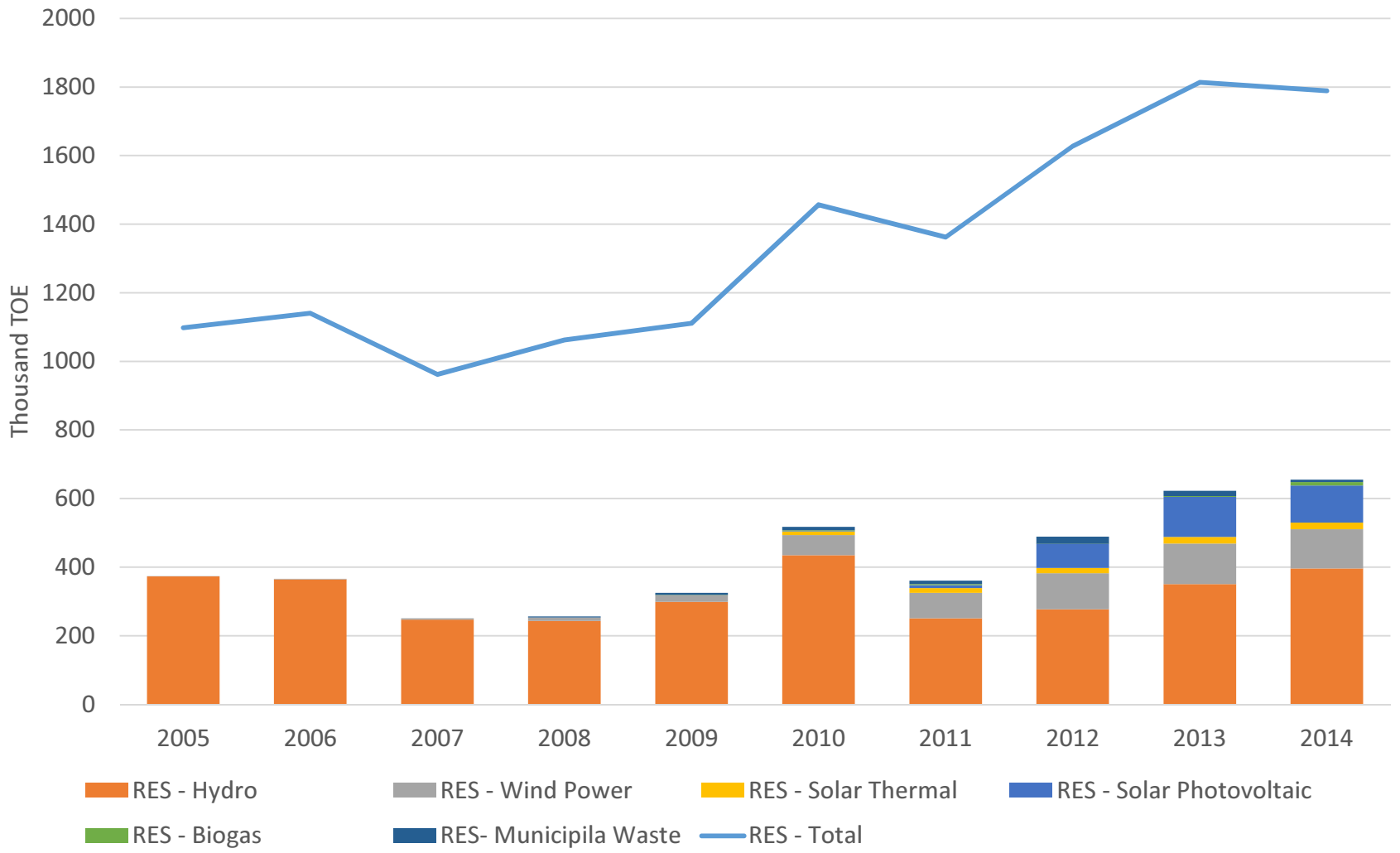

Source: EUROSTAT

Structure of Final (Net) Energy Consumption by Fuel in Bulgaria

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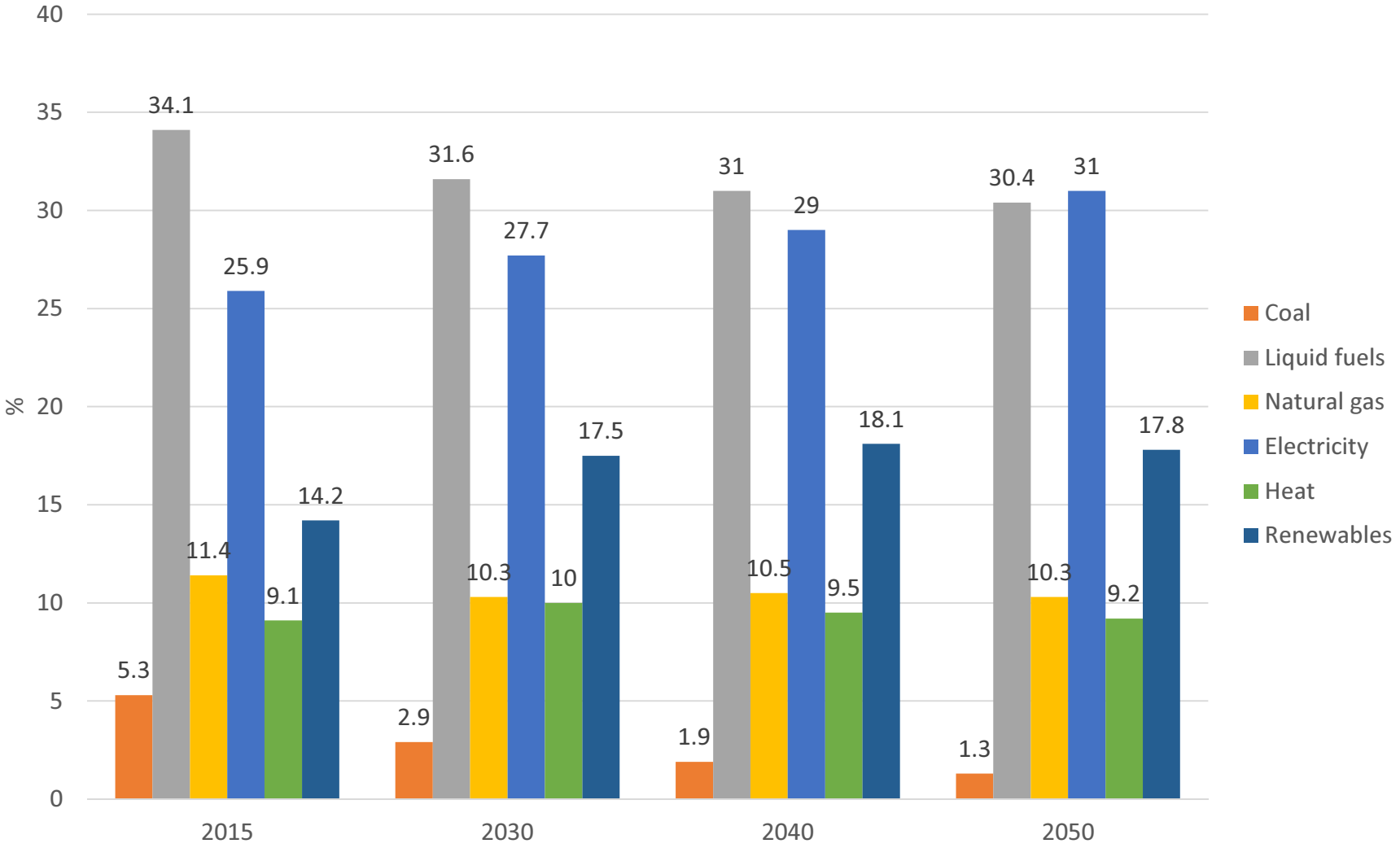

Source: PRIMES

Structure of Power Generation by Source 2015/2030 (%)

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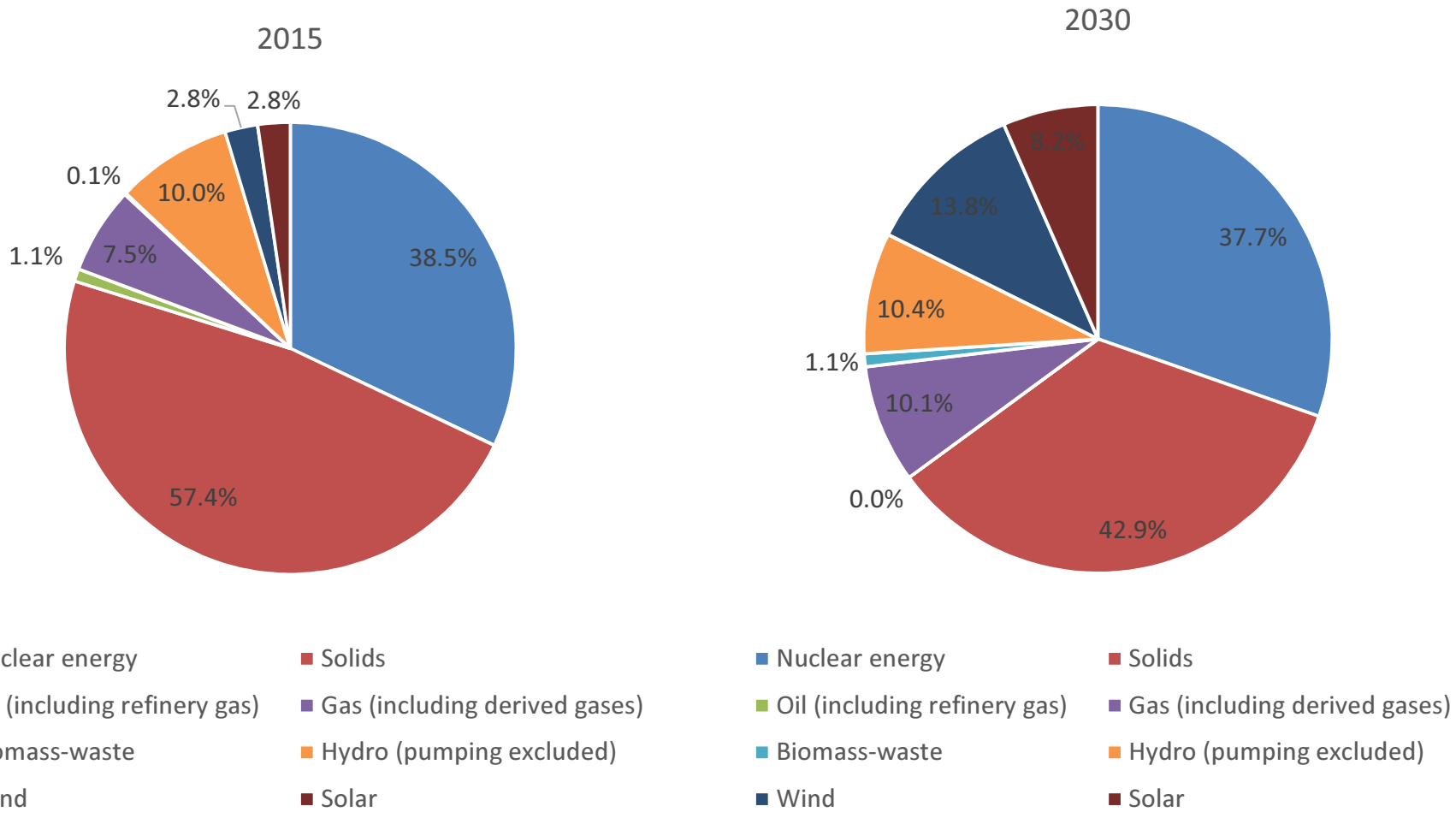

Source: PRIMES

Structure of Power Generation by Source 2050 (%)

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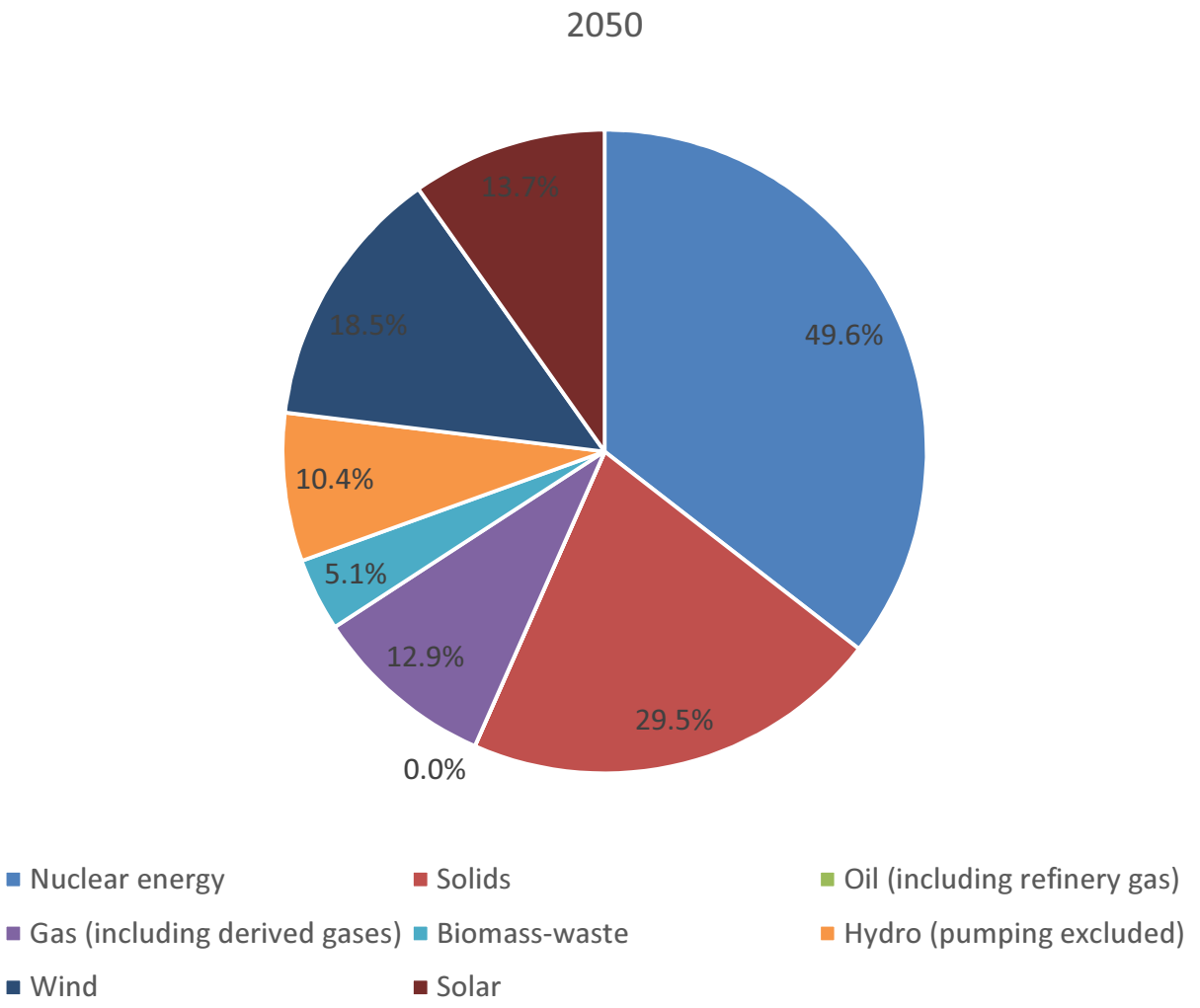

Source: PRIMES

RES Overall Development and By Sector in Bulgaria – Share of RES by sector from gross consumption (%)

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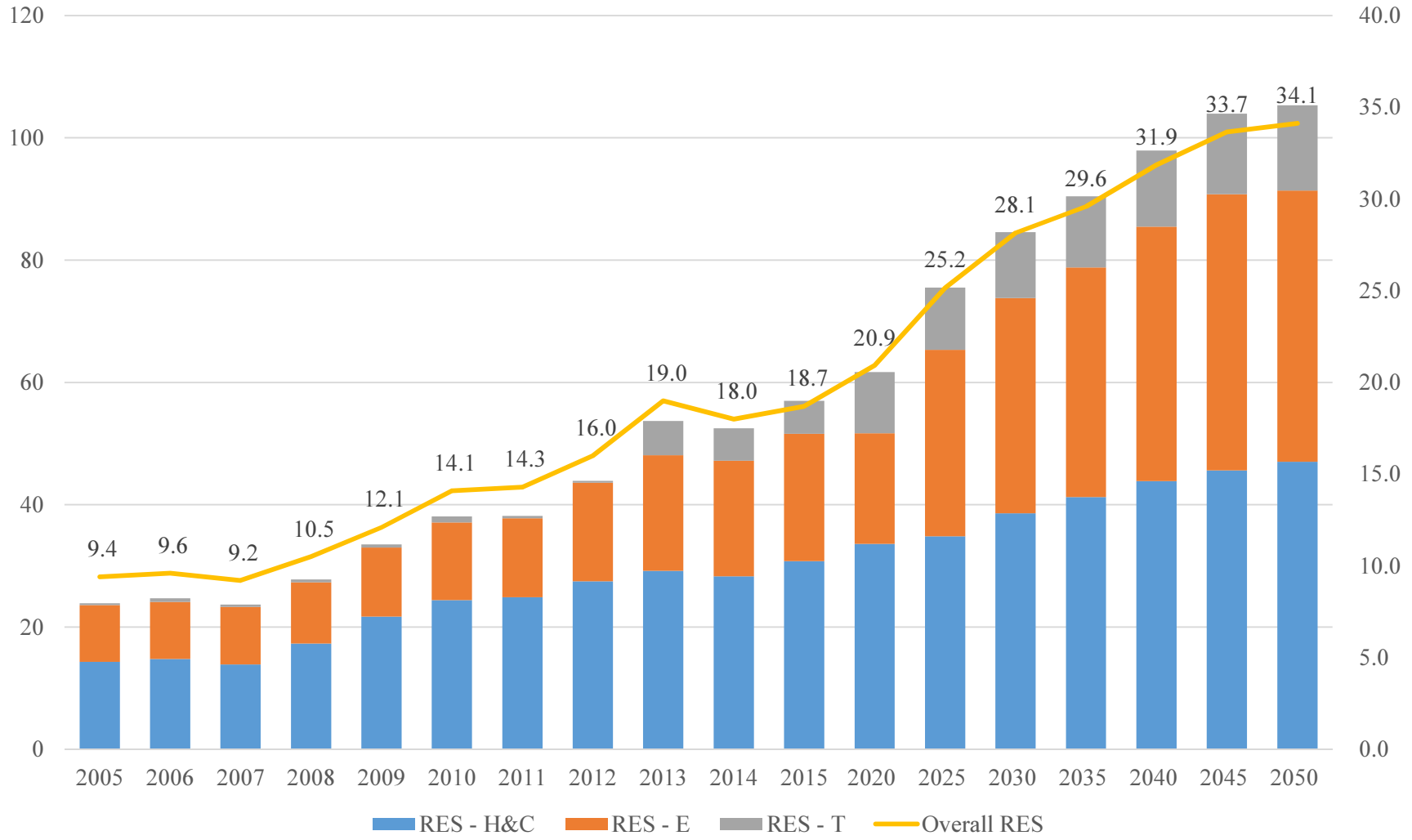

Source: EUROSTAT, ESO, PRIMES

RES-E Development

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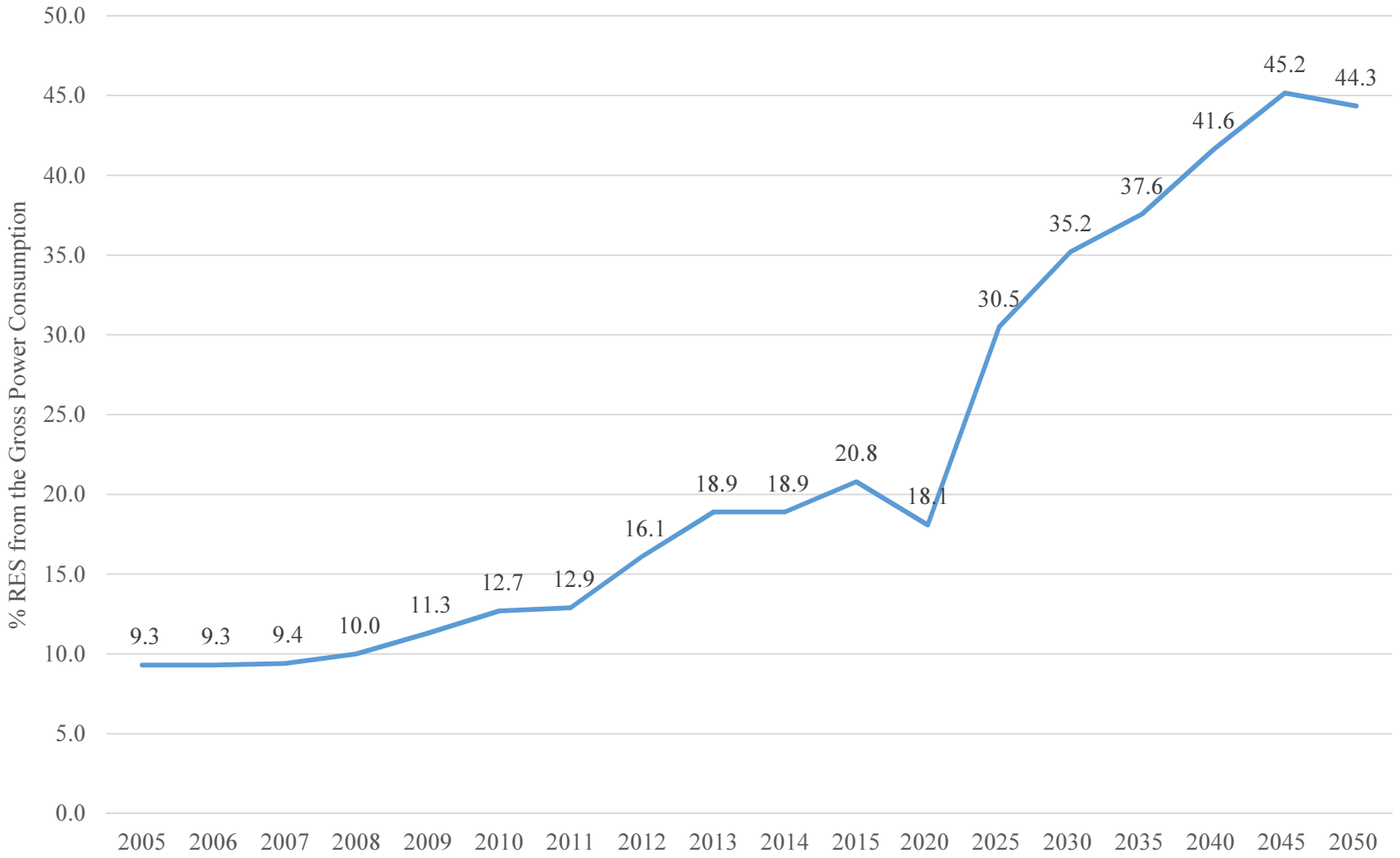

Source: EUROSTAT, ESO, PRIMES (REF 2016)

Key barriers and success factors

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- **Barriers:**
  - The energy system would not sustain high volumes of intermittent generation in a low carbon future, putting at risk the reliability of supply
  - Bottlenecks by the TSO and the DSOs for adding the RES to the grid
  - Intrasystem debt created by NEK's non-payment of compensation to DSOs paying the FiTs to RES
  - Decentralised micro renewable energy generation – no sale to the grid
  - Lack of social acceptability due to the corrupt implementation of FiTs
- **Success factors:**
  - High FiTs covering investment costs and guaranteeing quick ROI + suitable weather conditions for wind and solar power developments
  - The power system is flexible with enough back-up capacity to balance intermittent RES supply
  - Developed regional interconnections making Bulgaria a net exporter of electricity
  - Rare instances of reducing base-load supply or DSOs to stop RES purchases
  - Well developed network of large HPPs (owned by NEC)

Financial Framework for RES Support

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Year	Technology	IRR%	LCOE EUR per MWh		Wholesale market price EUR per MWh)
			Minimum	Maximum	
2011	Hydro power	9%	57,3	135,5	34,7
	Wind power	9%	70,1	97,7	0,0
	PV power	9%	248,3	309,5	0,0
	Biogas power	9%	61,0	221,3	0,0
	Biomass power	9%	61,0	221,3	0,0
2012	Hydro power	7%	50,2	117,3	34,7
	Wind power	7%	53,4	76,0	0,0
	PV power	7%	86,8	204,9	0,0
	Biogas power	7%	183,0	205,0	0,0
	Biomass power	7%	56,2	241,7	0,0
2013	Hydro power	7%	50,2	123,9	35,9
	Wind power	7%	53,8	89,9	0,0
	PV power	7%	81,9	181,0	0,0
	Biogas power	7%	172,5	197,9	0,0
	Biomass power	7%	45,6	231,7	0,0
2014	Hydro power	7%	47,9	121,1	38,1
	Wind power	7%	42,5	70,5	0,0
	PV power	7%	67,2	108,3	0,0
	Biogas power	7%	173,0	198,4	0,0
	Biomass power	7%	45,6	231,7	0,0

Source: Ministry of Energy

WACC Falling in Bulgaria

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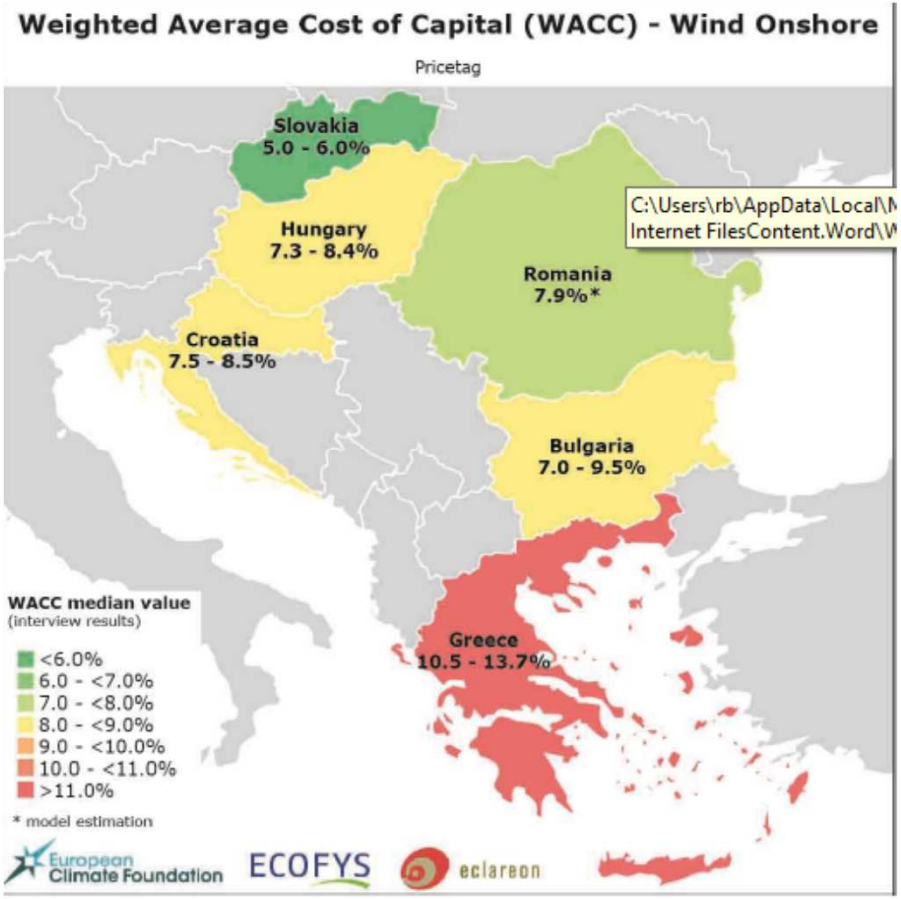
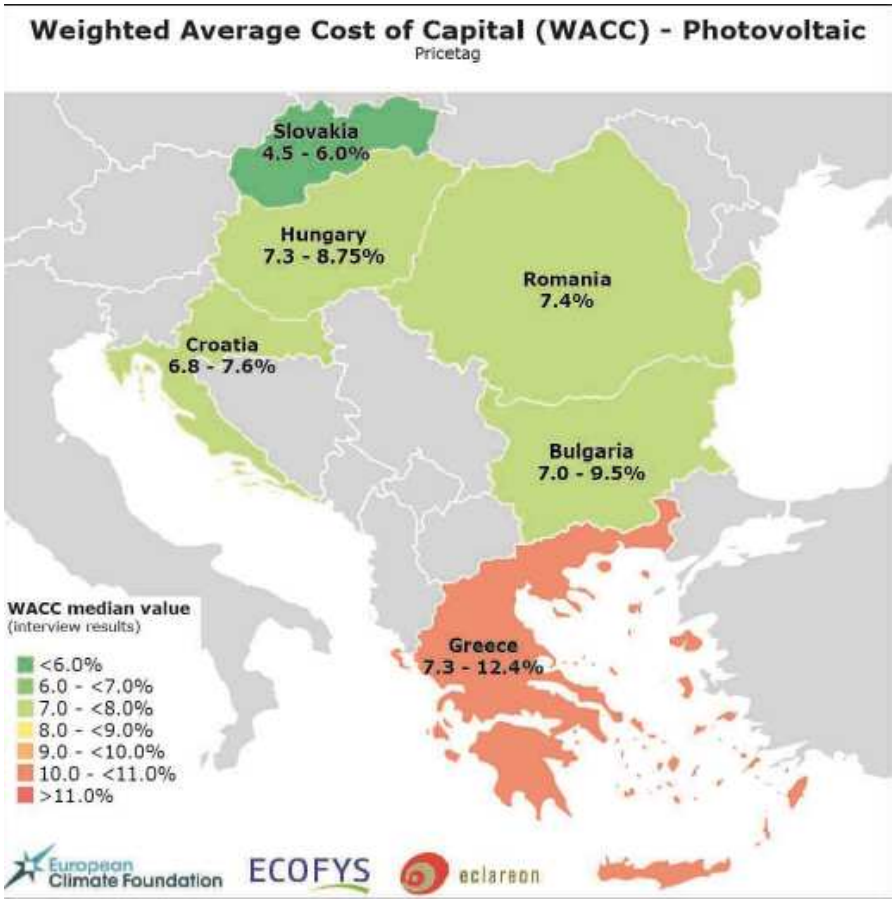
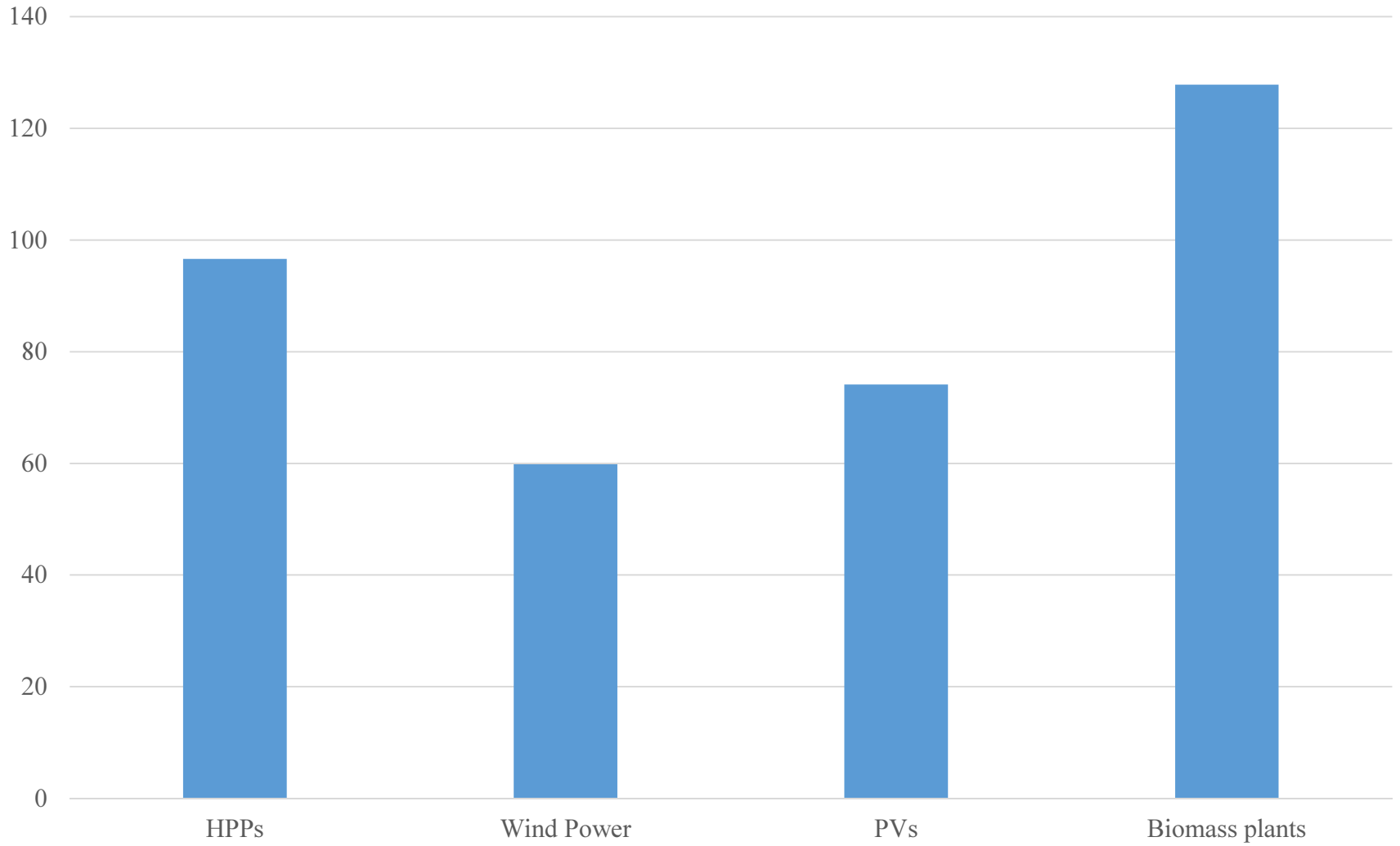




Source: 2016, ECOFYS

Average Feed-In Tariffs (EUR/MWh) By RES in 2014



Source: 2015, National Report on RES Implementation

Energy Affordability/Sustainability Nexus

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Social acceptability of RES support:

- RES FiTs are compensated through end-users' bills and special taxes – Social Responsibility Tax – EUR 18.26/MWh
- RES support costs around EUR 11,5 per MWh
- Households pay approx. EUR 34,25 per year for RES support
- Households pay the lowest power tariff in the EU – prices are kept artificially low
- 35-55% of the population is considered energy poor – No. 1 in EU
- Energy poverty aid to 230 000 households are granted with energy poverty aid which amounts to only EUR 36 per year
- In 2013, mass protests against rising power tariffs caused by RES, CHP and coal power plant support schemes toppled the government
- Full liberalization of the power market – socially unacceptable

Keeping the Regulated Prices Artificially Low

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MWh - EUR/MWh	2015-2016			2016-2017		
Suppliers	*Volume (MWh)*	*Price*	*Share in the Mix*	*Volume (MWh)*	*Price*	*Share in the Mix*
NPP Kozloduy	**1 021 230**	15,3	**6,42%**	**759 729**	15,3	**6,75%**
Big HPPs	**1 329 775**	30,2	**1,76%**	**286 450**	30,7	**8,78%**
CHPs	**2 472 097**	82,7	**18,03%**	**2 159 299**	68,5	**16,33%**
Renewable Energy Producers	**2 797 854**	139,6	**22,58%**	**2 761 040**	141,6	**18,81%**
TPP AES Galabovo	**3 035 682**	75,3	**19,93%**	**2 436 818**	86,8	**20,05%**
TPP Contour Global Maritsa East 3	**3 817 519**	55,5	**28,93%**	**3 537 292**	54,8	**25,22%**
TPP Maritsa East 2	**613 200**	34,7	**2,36%**	**288 000**	35,3	**4,05%**
Average Power Mix	**15 137 652**	**73,5**		**12 228 628**	**79,7**	**100%**
Final Power Mix Price after SRT and other deductions	**15 137 652**	**59,6**		**12 228 628**	**54,5**	

Significant Changes in RES Regulation 2015/2016

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- FiT support for new RES was withdrawn for new wind and PV capacities in 2015
- Annual hourly limit on mandatory purchases of all generated power from RES - 2015
- Access fee for RES to the grid later reversed by the High Administrative Court – 2013/2014
- 20% revenue tax on all new RES plants
- Retroactive reduction of RES FiT based on reevaluation of the additional EU financing the projects had received
- Corrupt-driven energy law amendment providing EUR 175/MWh FiT for biomass power plants using animal waste

2. Impact of 2014 State Aid Guidelines on RES-E support

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- in 2013 the Ministry of Energy of Bulgaria notified the EC that the 2020 RE share was already reached => Support schemes for new plants were fully cut off (except for micro-RE plants)
- the EC confirmed the national RE target was accomplished in compliance with the 2008 State aid Guidelines.=> no place to apply the 2014 Guidelines to new plants since RE share exceeded 16%
- 2030 RE share will be pursued using the 2014 Guidelines
- Bulgaria has not yet introduced an auctioning system for new RES-E support

2. Impact of 2014 State Aid Guidelines on RES-E support

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- Imported power coming from RES produced in an EU member-states will be exempt from the surcharge tax
- Bulgarian authorities have committed to invest the income generated from the tax on the RES imports from EU countries (2011-2016) in a new power interconnection – 400 kV 'Maritsa Istok – Nea Santa' with 1500 MW capacity – around EUR 500 million
- Energy intensive consumers were exempted from paying up to 85% from the SRT

3. Long term energy/electricity vision of your country

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Energy strategy:

- Latest long-term national energy strategy dates from 2011
- Up-to-date energy strategy postponed due to political uncertainty in Bulgaria
- 2011 energy strategy sets up targets only to 2020 which fully takes into account EU 20-20-20 objectives
- The Energy Ministry uses the PRIMES Model directly due to lack of financing for the purchase of a modelling tool

Carbon Pricing Policy

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- Bulgaria does not have a national carbon pricing policy - abides by the EU ETS rules.
- RES deployment in Bulgaria: mainly driven by high FiTs, rather than by carbon pricing
- Bulgaria benefits from an exemption under the ETS allowing it to grant free carbon allowances to power plants until 2020
- Coal power units in Bulgaria: driven away from the energy mix due to market liberalization and compliance with EU climate rules than by ETS prices

Power Demand Forecast (2015-2024)

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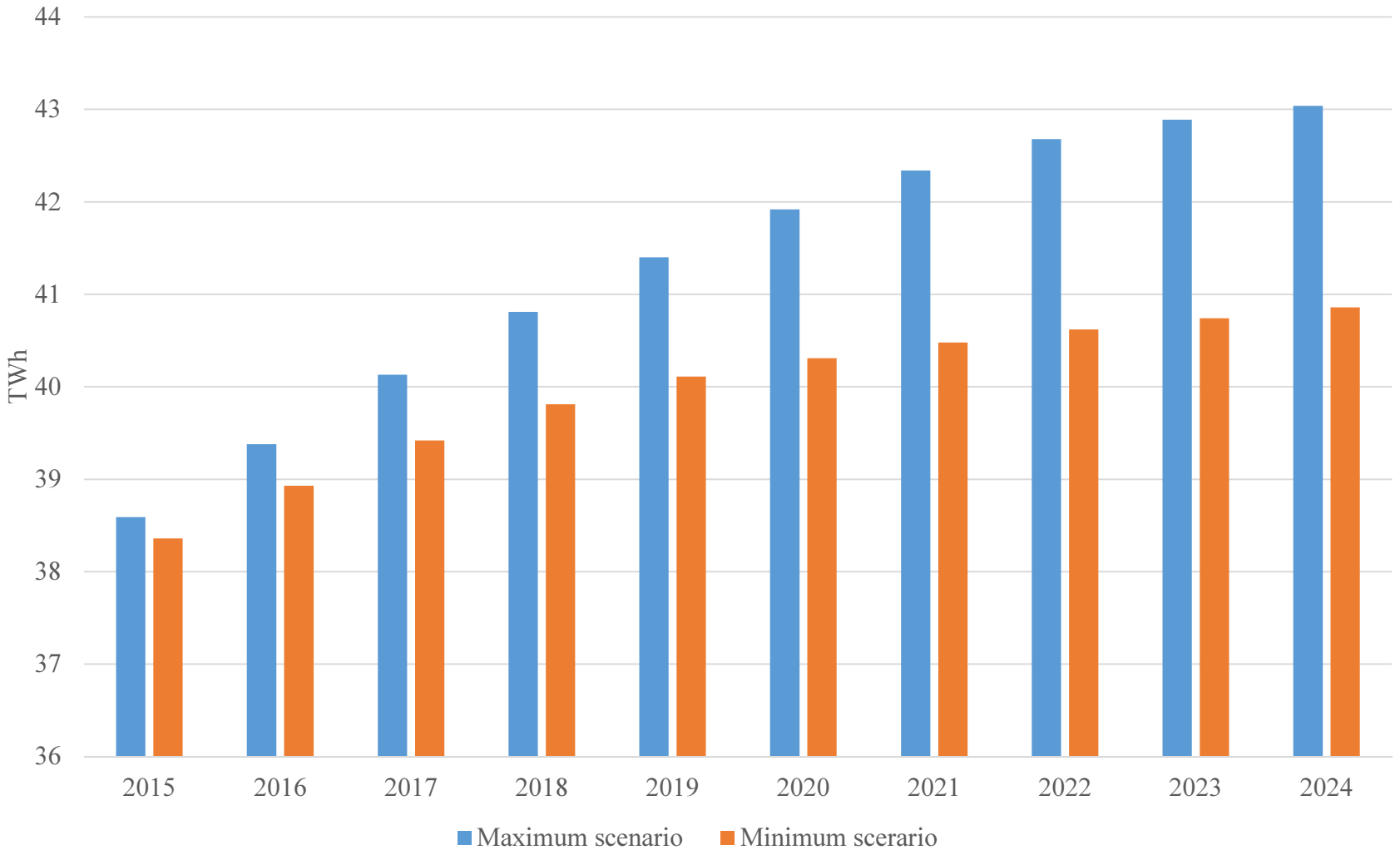

Source: Bulgarian Transmission Systems Operator (ESO)

New RES Installed Capacity Forecast

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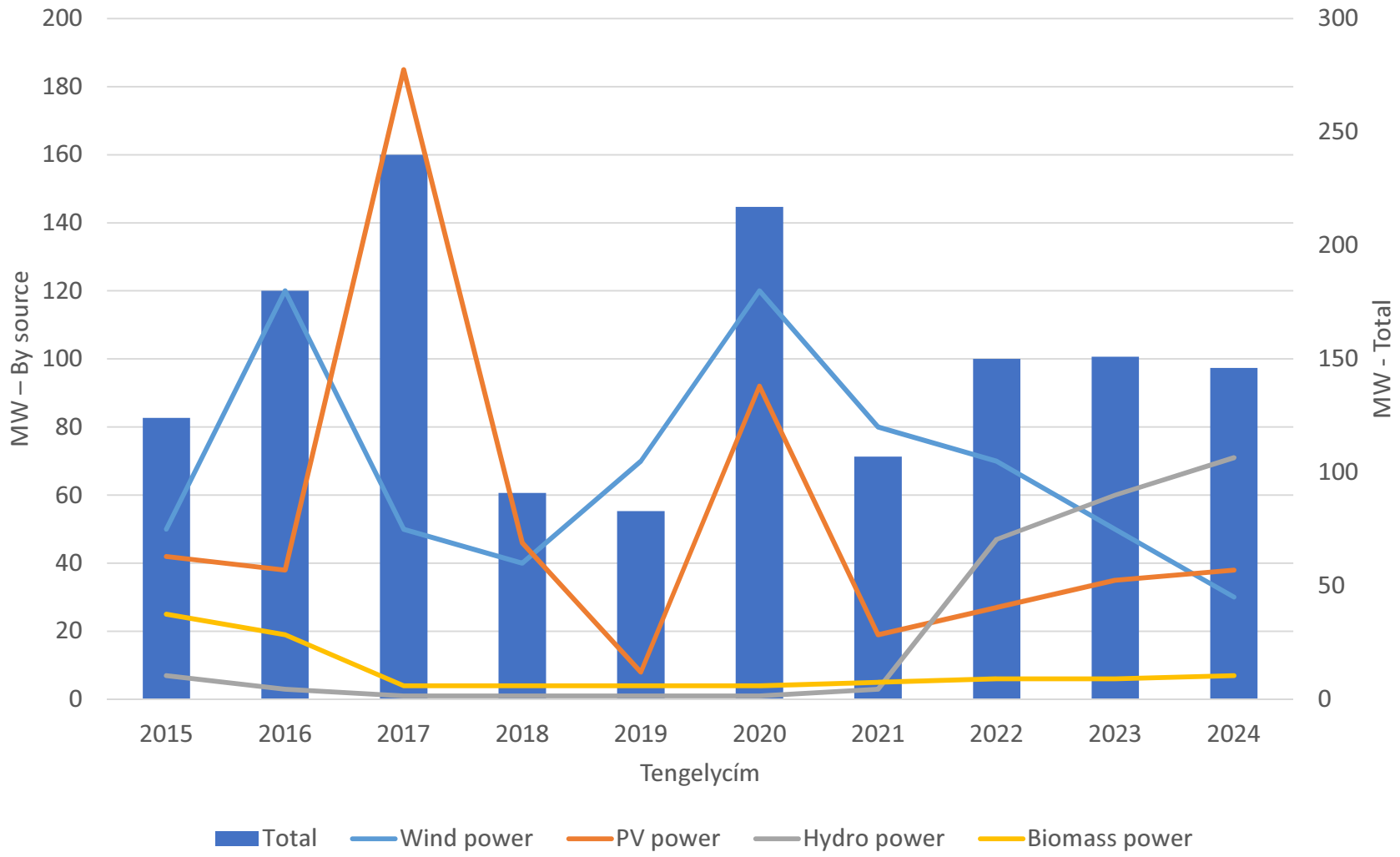

Source: Bulgarian Transmission Systems Operator (ESO)

CSD Energy Security and Policy Publications

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- Energy Sector Governance and Energy (In)Security in Bulgaria
- Green Growth and Sustainable Development for Bulgaria: Setting the Priorities
- Green Energy Governance in Bulgaria at a Crossroads
- CSD Policy Brief No. 62: Energy Security Risks and the Case for Natural Gas Diversification
- CSD Policy Brief No. 58: Transparent Governance for Greater Energy Security in CEE
- Country fact-sheets on national energy security indicators
- CSD Policy Brief No. 47: EU and NATO's role in tackling energy security and state capture risks in Europe
- CSD Brief No 23: Energy Efficiency in Bulgaria: The Case for Market-Based Approach and Transparency
- Ensuring Effective Cooperation Between Eu And Turkey To Foster Energy Security

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