

Technical assistance in realisation of the 4th
report on progress of renewable energy in the EU
Member States' Factsheets on Progress on Renewable Energy

- Final report -



Technical assistance in realisation of the 4th report on progress of renewable energy in the EU

Member States' Factsheet on Progress on Renewable Energy

Ecofys: Michèle Koper, Corinna Klessmann, Felix von Blücher, Tobias Sach

eclareon: Robert Brückmann, Céline Najdawi, Jan Benjamin Spitzley, Jörn Banasiak

Fraunhofer ISI: Barbara Breitschopf, Matthias Kühnbach, Simone Steinhilber, Mario Ragwitz

TU Wien: Gustav Resch, Lukas Liebmann, Franziska Schöniger

Date: 11 February 2019

Project number: SISNL17791

“The information and views set out in this report are those of the author(s) and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this study. Neither the Commission nor any person acting on the Commission’s behalf may be held responsible for the use which may be made of the information contained therein.”

“The analysis presented in this report is based on the policy landscape until December 2018. Modelling results are based on the progress reports submitted by the Member States and policy updates until May 2018.”

© Ecofys 2018 by order of: European Commission DG ENER

Table of contents

Introduction to Member States' factsheets	4
Belgium	6
Bulgaria	8
Czech Republic	10
Denmark	12
Germany	14
Estonia	16
Ireland	18
Greece	20
Spain	22
France	24
Croatia	26
Italy	28
Cyprus	30
Latvia	32
Lithuania	34
Luxemburg	36
Hungary	38
Malta	40
Netherlands	42
Austria	44
Poland	46
Portugal	48
Romania	50
Slovenia	52
Slovakia	54
Finland	56
Sweden	58
United Kingdom	60

Introduction to Member States' factsheets

This report complements and should be read together with the in-depth analysis "Technical assistance in realisation of the 4th report on progress of renewable energy in the EU". It presents a brief summary of main results and findings provided at Member State (MS) level. For more detail, background and the full analysis, please refer to the information provided in the in-depth analysis report.

This report informs on the achieved (until 2016) and the expected (up to 2020) renewables (RES) progress, country by country. Complementary to the quantitative assessment we summarise whether MS are on track to meeting their binding 2020 RES targets as defined in the RES Directive (2009/28/EC). Furthermore, the most important RES support instruments per sector (electricity, heating & cooling, transport) as well as key barriers to RES deployment are summarised¹. A breakdown of RES generation between sectors and technologies conclude this brief report on each MS.

The **quantitative assessment of RES progress** combines historic trends, taken from the MS progress reports² and EUROSTAT, with a prospective model-based analysis. The forward-looking part aims to clarify to what extent current RES policies (Current Policy Initiatives (CPI)), complemented by Planned Policy Initiatives (CPI+PPI), appear sufficient to trigger the targeted RES deployment up to 2020 at MS level. The scenario calculation applied the Green-X model, a well-established simulation tool for policy instruments in the European RES market indicating consequences of policy choices on deployment and cost of RES technologies in a comprehensive manner.

Results show past (until 2016) and projected progress in the short term (2018) and for 2020, indicating by MS the likeliness of delivering the binding national targets for overall RES deployment set by the RES directive (RED) and the indicative NREAP trajectories (in total and by sector). As part of the model-based analysis, an extended sensitivity analysis has been performed, relating to expected future energy demand (growth), policy "transformation"³ and country-specific financing risk⁴.

¹ Information on currently implemented and planned policy initiatives is taken from MSs progress reports, complemented by data on implemented policy measures extracted from the RES-legal web platform (www.res-legal.eu) and further sources. Policy developments that have taken place until end of 2018 are taken into consideration for the qualitative description of RES support instruments. For the model-based assessment the process of data gathering has been finalised by May 2018 and, consequently, any later policy changes (not reported as planned in the respective progress reports) could not be taken into consideration within the quantitative analysis of 2020 RES progress.

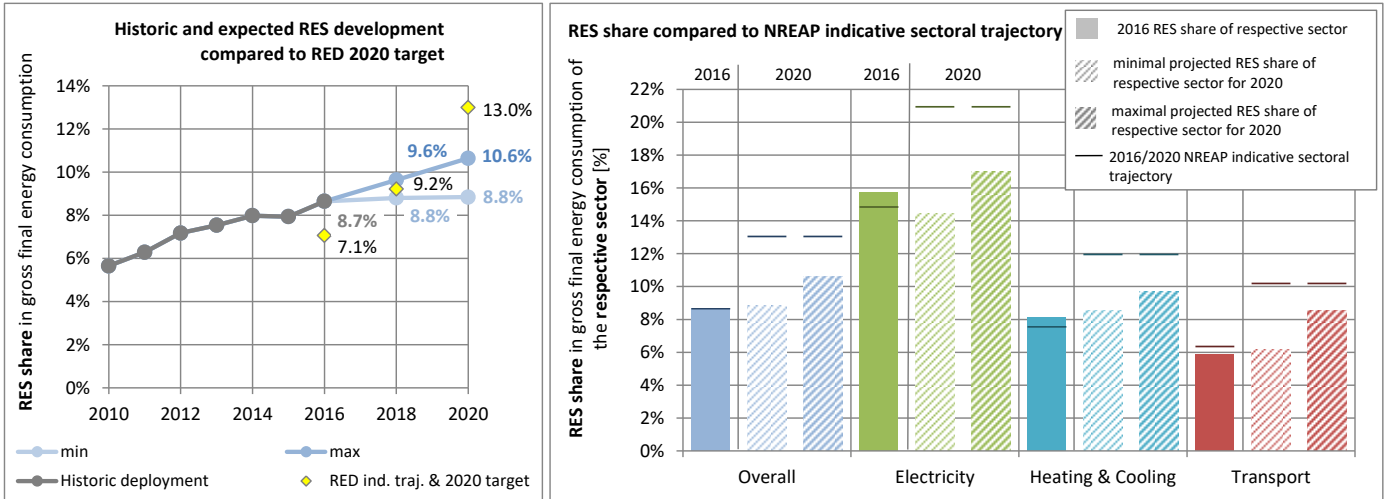
² In accordance with Article 4 of RES Directive each MS has submitted an NREAP to the European Commission in 2010 or later. In its NREAP, each MS provides a detailed roadmap describing how it will meet its legally binding national 2020 RES target. In addition, some MS define slightly more ambitious non-mandatory 2020 NREAP targets. The roadmaps contain indicative sectoral trajectories and the technology mix they expect to use. Every two years, each MS has to submit a report on the developments in RES compared with the trajectories in its NREAP ("Progress Reports").

³ Related to the transformation of information provided by MS on implemented and planned measures into the modelling logic, for details please see the main report.

⁴ Financing risk may either remain or, thanks to a proactive mitigation, an alignment of financing conditions may take place across MSs in forthcoming years.

For the sensitivity analysis, the impact of each of those aspects was assessed individually, and, later on, combined to form two cases – a pessimistic case and an optimistic case (e.g. assuming an optimistic variant with respect to future demand growth and the overall policy implementation). This approach finally translates into a minimum and maximum path of future RES deployment (min-max).

Belgium



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	8.7%	15.8%	8.1%	5.9%
2016 NREAP trajectory	8.6%	14.8%	7.5%	6.3%
2015/2016 indicative interim trajectory (set by RED)	7.1%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	8.8 - 9.6%	15.7 - 17%	8 - 8.6%	6 - 6.9%
2018 NREAP trajectory	10.7%	18.2%	9.6%	7.9%
2017/2018 indicative interim trajectory (set by RED)	9.2%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	8.8 - 10.6%	14.4 - 17%	8.5 - 9.7%	6.2 - 8.6%
2020 NREAP trajectory	13.0%	20.9%	11.9%	10.1%
2020 target (set by RED)	13.0%			

Target achievement: status quo and outlook

- The projected RES deployment and gross final energy demand for 2020 indicate that Belgium would fail to meet its 2020 RED target if no further action is taken. The overall gap, compared to the RED 2020 target of 13.0%, is projected to stay in the range of 2.4 percentage points (pp) to 4.2 pp in all scenarios, partly because of assumed increases in energy demand. Hence, Belgium should take additional policy measures and consider the use of statistical transfer to reach its 2020 RED target.
- Belgium has achieved its 2016 NREAP indicative sectoral trajectories in RES-E and RES-H&C. In RES-T however, there was a small gap of 0.4 pp. Still, the overall RES share in gross final energy demand met the overall NREAP trajectory, as well as the RED indicative trajectory in 2016.

Main policy instruments:

- RES-E:** Green certificates are the main support mechanism, with slight differences in application and price levels between the regions. Belgium distinguishes two levels of policy administration (national and regional), with a strong autonomy to shape renewable energy policies at the level of the three regions: Flanders, Wallonia and the Brussels Capital Region. Each of the regions operates its own green certificate (GC) scheme.
- RES-H&C:** The main elements of federal RES-H&C policy support are tax deductions for investments and a certificate scheme for cogeneration. Additional policy measures at regional level are investment grants, for example to support the installment of biomass boilers, heat pumps and solar thermal panels.
- RES-T:** Support for RES-T is mainly arranged at the federal level. The main support instrument is a biofuel quota. As of 2017, the Federal Government increased the mandatory blending percentage for petrol to 8.5% by volume.

Barriers to RES deployment

Support scheme issues are considered to be the most important barriers in all three sectors of the country. In fact, the numerous changes to the support system on a yearly basis have shattered the confidence of stakeholders. Additionally, barriers resulting from grid issues remain significant in the electricity sector, while barriers regarding administrative issues have been gradually removed over the last years. The overall improvement is the highest in the electricity sector, while barriers in the other sectors stagnated. The heating sector faces serious barriers in the legislation for building and planning.

Electricity

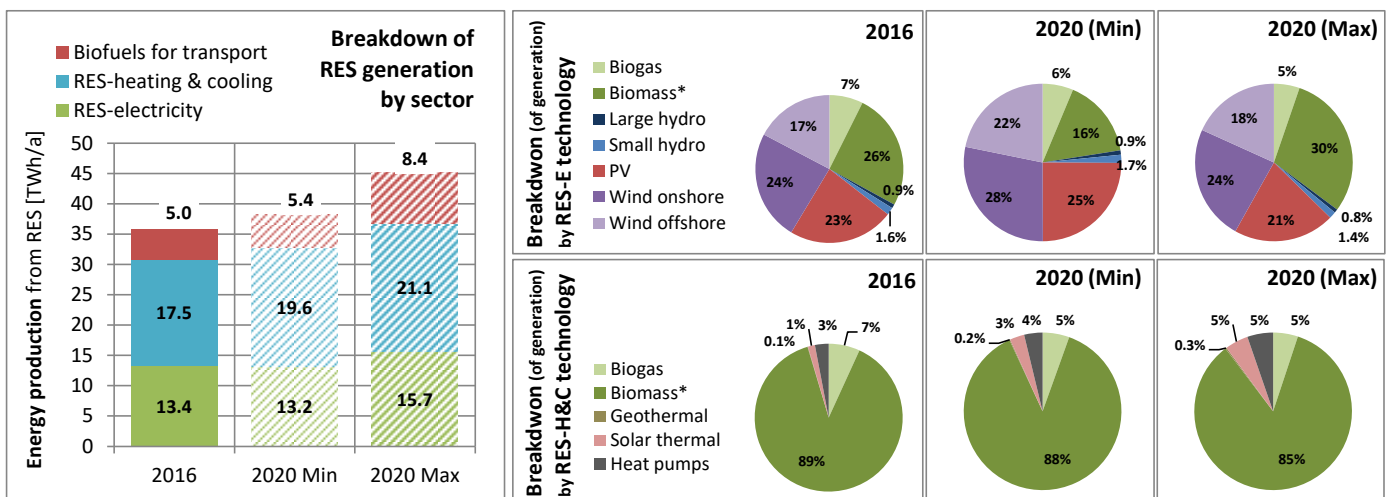
- Lack of political unity and conflict of jurisdiction between national and regional level results in potentially contradictive energy-related regulations both at national and regional level, thus causing uncertainty among stakeholders
- Fees have to be paid for injecting electricity at distribution grid level. This undermines the level playing field between RES and conventional plants, as RES are mostly connected to the distribution grid, whereas conventional plants are often connected to the transmission grid.

Heating and Cooling

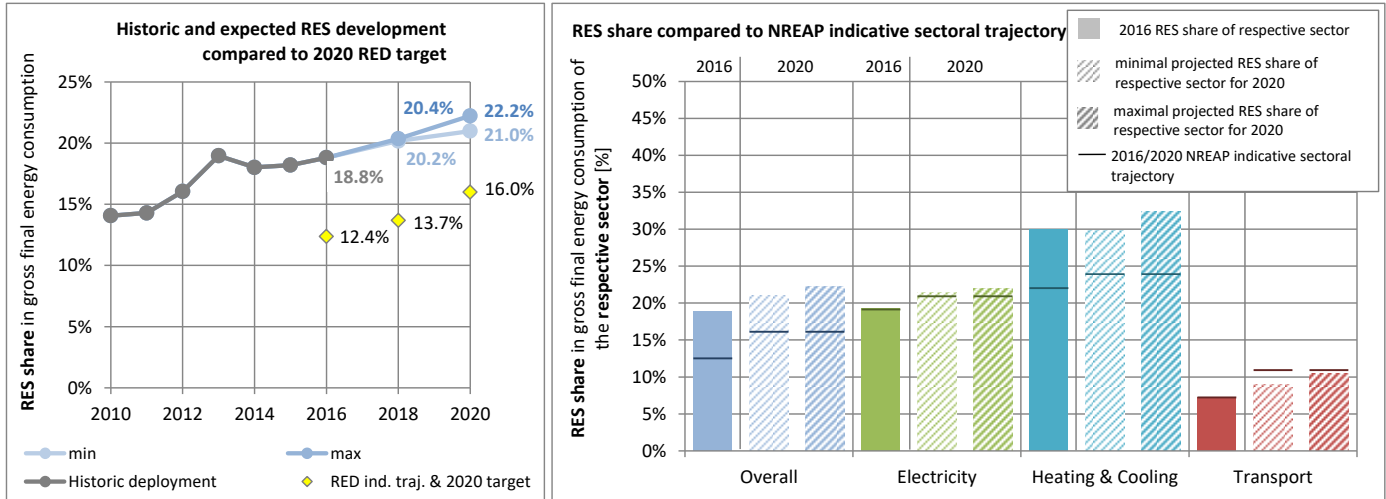
- Lack of political attention for reforming and developing the support schemes
- Poor condition of existing district heating networks

Transport

- Unstable support framework, especially for different biofuel technologies
- Discussions at EU-level on future blending targets hamper the development of the biofuels sector



Bulgaria



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	18.8%	19.2%	30.0%	7.3%
2016 NREAP trajectory	12.4%	19.0%	21.9%	7.1%
2015/2016 indicative interim trajectory (set by RED)	12.4%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	20.2 - 20.4%	20.8 - 21%	29.3 - 30.7%	7.4 - 7.7%
2018 NREAP trajectory	13.7%	20.4%	22.3%	9.4%
2017/2018 indicative interim trajectory (set by RED)	13.7%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	21 - 22.2%	21.5 - 22%	29.8 - 32.4%	8.9 - 10.4%
2020 NREAP trajectory	16.0%	20.8%	23.8%	10.8%
2020 target (set by RED)	16.0%			

Target achievement: status quo and outlook

- The overall RES share in 2020 is projected to be in the range between 21.0% and 22.2%, which would mean that Bulgaria achieves its 2020 RED target of 16%. Bulgaria's overall RES share in 2016 was already 18.8% - that is 2.8 pp above the country's 2020 RED target level. The main reason is the high share of RES in the Heating & Cooling sector.
- In forthcoming years, a slight increase of the shares in all three sectors is expected. In the Heating & Cooling sector, the RES share in 2016 was already higher than Bulgaria's 2020 NREAP sectoral trajectory level. In the RES-E sector, photovoltaics is gaining importance. Still, large hydro power is expected to make the main contribution to the RES-E share.

Main policy instruments:

- RES-E:** In May 2018, Bulgaria switched from a feed-in tariff system to the payment of a premium. All producers of electricity from renewable sources with a total installed capacity of at least 4 MW are required to sell their energy through the exchange market.
- RES-H&C:** Renewable heating and cooling in Bulgaria is primarily supported through loans and tax incentives. The Bulgarian Energy Efficiency Fund is a revolving fund that offers loans for projects that improve the energy efficiency of buildings. The Fund supports the installment of a wide range of RES-H&C technologies, including aerothermal, geothermal, hydrothermal, solar thermal and bioenergy. The Fund contributes 10-25% in equity and recipients pay reduced interest rates of 4-7% per year.
- RES-T:** RES-T in Bulgaria is mainly supported through a biofuel quota for fuel suppliers and a tax regulation mechanism. As of 1st March 2019, the fuel for petrol engines should contain at least 9% bioethanol produced from biomass. Furthermore, as of 1st April 2019, diesel fuel should have a minimum of 6% biodiesel, with at least 1% biodiesel being biofuel of a new generation. If these requirements are not met, significant financial penalties are in place.

Barriers to RES deployment

Support scheme issues are considered to be the most important barriers in all three sectors of the country. In the electricity sector, this is followed by grid and building and planning issues, as well as administrative issues, which all remained constant in its severity over the last years.

Electricity

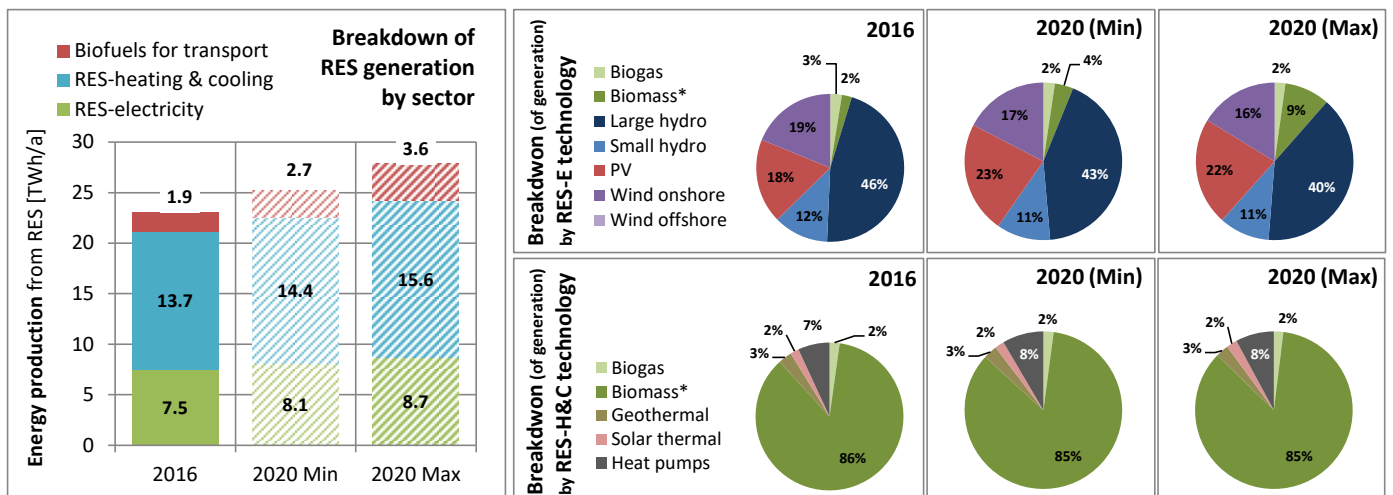
- Many and partially retroactive changes regarding support schemes
- High frequency and lack of transparency in regulatory changes
- Insufficient integration into spatial and environmental planning

Heating and Cooling

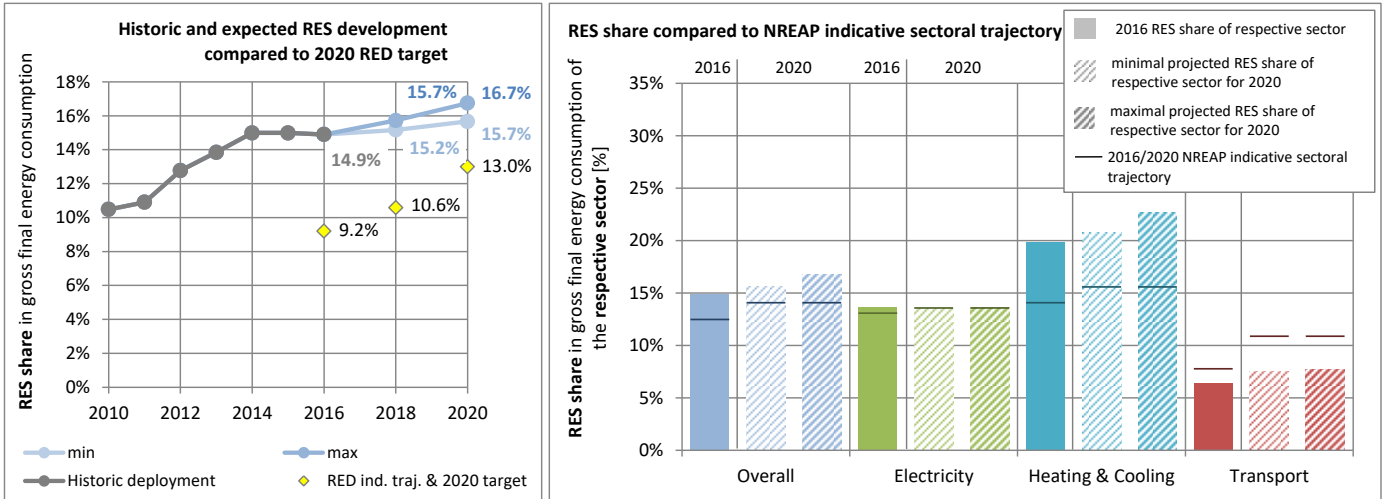
- Low remuneration level for biogas
- Grid operation rules impede the development of CHP installations

Transport

- No incentive for e-vehicles in place
- Taxation level based on engine power instead of emissions



Czech Republic



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	14.9%	13.6%	19.9%	6.4%
2016 NREAP trajectory	12.4%	13.0%	14.0%	7.7%
2015/2016 indicative interim trajectory (set by RED)	9.2%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	15.2 - 15.7%	13.5 - 13.6%	19.9 - 21%	7.1 - 7.3%
2018 NREAP trajectory	13.3%	13.4%	14.8%	9.6%
2017/2018 indicative interim trajectory (set by RED)	10.6%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	15.7 - 16.7%	13.5 - 13.7%	20.8 - 22.7%	7.5 - 7.8%
2020 NREAP trajectory	14.0%	13.5%	15.5%	10.8%
2020 target (set by RED)	13.0%			

Target achievement: status quo and outlook

- The country's overall RES share in 2020 is projected to range between 15.7% and 16.7%, well above the 13% RED target. The RES-E share is expected to stay more or less constant compared to 2016, while the RES-H&C sector is expected to contribute the most to additional RES deployment between 2017 and 2020. The Czech Republic had an overall RES share in gross final energy consumption of 14.9% in 2016 which is above the country's 2020 RED target level of 13%.
- All 2016 NREAP indicative trajectories except for the RES-T share were met. The planned RES-E share in 2016 was surpassed by 0.6 pp, the RES-H&C share by 5.9 pp and the overall RES share by 2.5 pp. In the transport sector, the NREAP indicative trajectory of 7.7% in 2016 was missed by 1.3 pp. The projected RES deployment and gross final energy demand for 2020 result in a share of RES-H&C between 20.8% and 22.7%, which is well above the NREAP sectoral trajectory of 15.5%.

Main policy instruments:

- RES-E:** Electricity from renewables is supported through guaranteed feed-in tariffs or feed-in premia, which are paid on top of the market price. However, as of 2014 these schemes are discontinued for new renewable projects. Abrupt and restrictive changes to the taxation of solar PV were introduced in recent years. Investment grants for distributed renewable energy are currently the only support instrument for new installations. The grants support biomass and biogas CHP plants, small hydropower (i.e. up to 10 MW), as well as rooftop and façade solar PV systems in public buildings.
- RES-H&C:** Renewable heating in the Czech Republic is primarily supported through tax incentives and investment grants. Grants are provided for biomass and biogas CHP. Tax exemptions are granted for renewable heating plants (biogas, biomass, hydrothermal, geothermal and air-source heat pumps). Subsidies are also available for the use of solar thermal on buildings and private households.
- RES-T:** The main instruments are a biofuel quota and tax exemptions. No trajectory has been established for the increase of biofuels in the energy mix. An amendment has been submitted that would introduce double counting for the period 2018 – 2020. Biofuels are exempt from the consumption tax. Plans to foster electric mobility, e.g. via accelerated depreciation of electro mobiles, are considered. Various subsidy programmes aim to foster electric mobility, either by incentivising the direct purchase of alternative propulsion vehicles (incl. electric ones) or supporting the infrastructure development.

Barriers to RES deployment

Support scheme issues are a relevant barrier across all three sectors. In the electricity sector, administrative, information, building and planning issues have limited further development of RES plants over the last years. Although a few political initiatives were taken in the transport sector in 2015 and 2017 (e.g. Memorandum on the Future of the Automotive Industry and Action Plan on the Future of the Automotive Industry in the Czech Republic in 2017), the pace of the proposed measures' implementation is considered slow. On the contrary, barriers dealing with information issues in the heating sector have been gradually removed.

Electricity

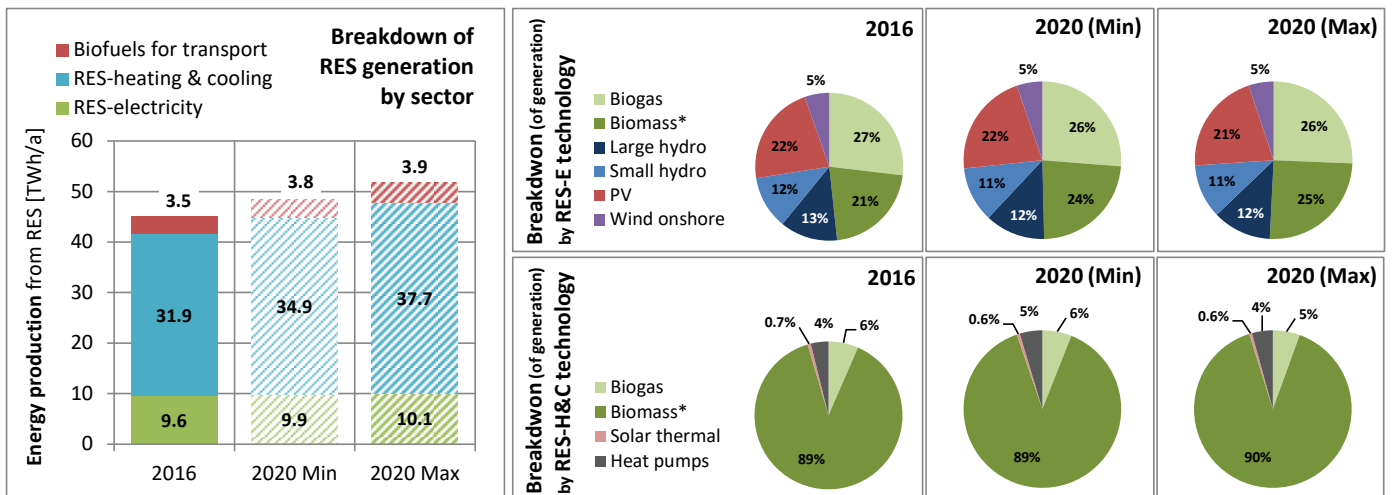
- Abolishment of the main support scheme for new RES from 2014
- Abrupt and frequent changes of the legislative environment, e.g. abolishment of RES tax holiday, recycling fee for PV panels, introduction of the solar tax, revision mechanism on adequacy of the amount of the state-granted support to renewable energy projects
- Many authorities involved in the licensing process
- Too restrictive planning documents of Regions on the construction of PV and wind plants
- Unfavourable framework conditions for hydropower plants, e.g. lack of integration in spatial planning,

Heating and Cooling

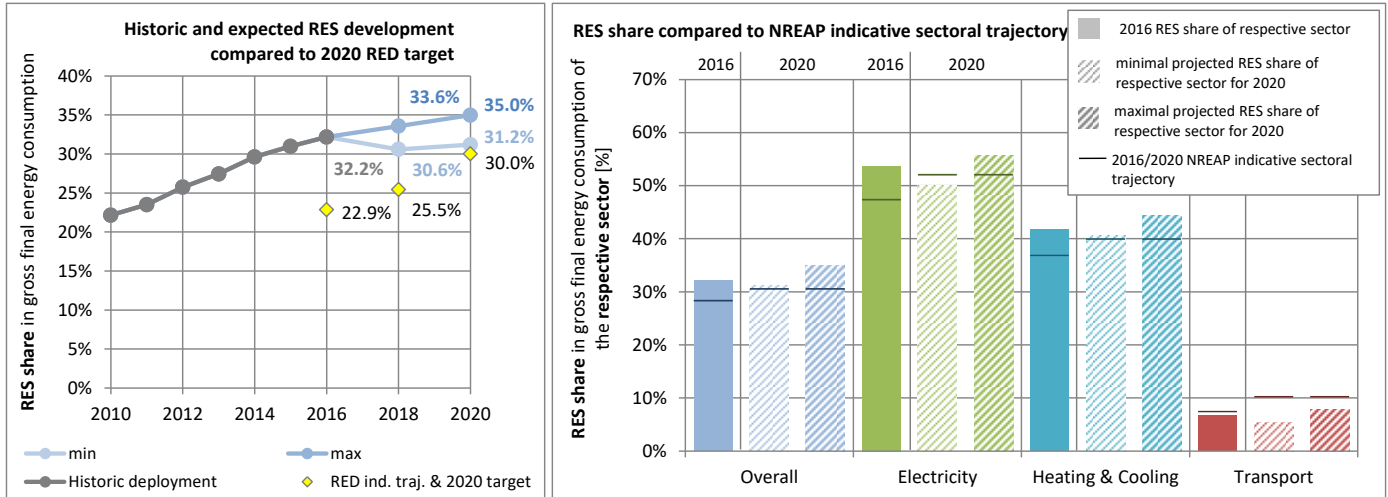
- Low reliability of the legislation with frequent restrictive measures

Transport

- Very slow and unsatisfactory implementation of the National Action Plan for Clean Mobility (2015)
- Poor quality of the charging infrastructure for electric vehicles
- Limited transparency of the DSO's decisions and its dominant position on the market



Denmark



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	32.2%	53.7%	41.7%	6.8%
2016 NREAP trajectory	28.2%	47.2%	36.7%	7.3%
2015/2016 indicative interim trajectory (set by RED)	22.9%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	30.6 - 33.6%	51.8 - 57.3%	38.8 - 41.5%	5.4 - 6.8%
2018 NREAP trajectory	29.1%	49.7%	37.7%	8.6%
2017/2018 indicative interim trajectory (set by RED)	25.5%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	31.2 - 35%	50.1 - 55.7%	40.6 - 44.3%	5.4 - 7.8%
2020 NREAP trajectory	30.4%	51.9%	39.8%	10.1%
2020 target (set by RED)	30.0%			

Target achievement: status quo and outlook

- For 2020, Denmark is projected to reach an overall RES share of 31.2% to 35.0%, well above the 2020 target of 30% set by the RED. Denmark has achieved an overall RES share of 32.2% in gross final energy consumption in 2016, which was already higher than its 2020 RED target level.
- The main contribution to the fulfilment of the target is expected to come from the RES-H&C sector with biomass accounting for more than 80% in the RES-H&C sector. In 2016, the RES-T sector was the only sector lagging, leaving a gap of 0.5 pp compared to its 2016 RES-T NREAP indicative trajectory.

Main policy instruments:

- RES-E:** The main support scheme is a feed-in premium which applies to wind, solar and hydro power, as well as biogas and biomass. Denmark is moving to tendering schemes. A first 20 MW pilot auction for solar PV was held in December 2016. A regular tender specifically for solar PV is planned for 2018, as well as a technology-neutral tender for solar PV and wind power for 2018/2019. Offshore wind sites have been tendered for many years already. In addition, net metering is available to RES-E plant owners.
- RES-H&C:** Renewable energy fuels are exempted from the energy tax on fuels for heating purposes. Furthermore, Denmark has introduced a premium tariff for biogas for transport, processing and heat. In this scheme, 1.34 – 3.5€/GJ biogas are paid to consumers using biogas for heating purposes.
- RES-T:** The main instrument is a biofuel quota. Furthermore, biofuels are exempt from the CO₂ tax and there is a premium for the use of biogas for transport. Electric vehicles are supported via lowered registration tax and research schemes.

Barriers to RES deployment

There have been moderate and minor support scheme issues impeding the development of RES in the electricity sector. However, they have been resolved by the Energy Agreement in June 2018. Additionally, the electricity sector faces some barriers due to the limited grid capacity.

Electricity

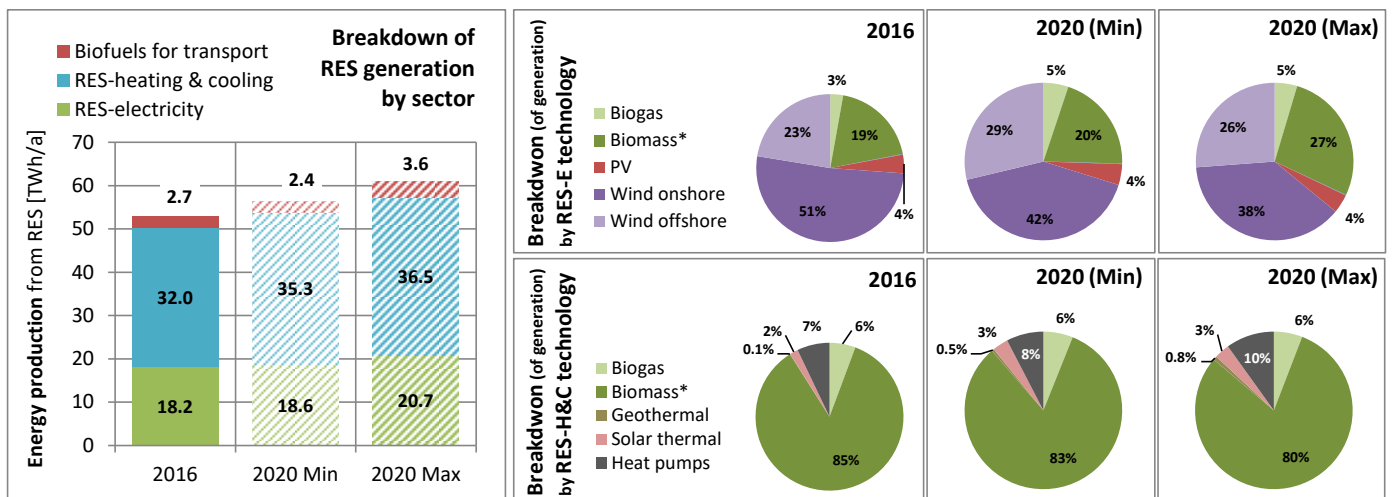
- Increasing strain on electricity grids due to fluctuating electricity production

Heating and Cooling

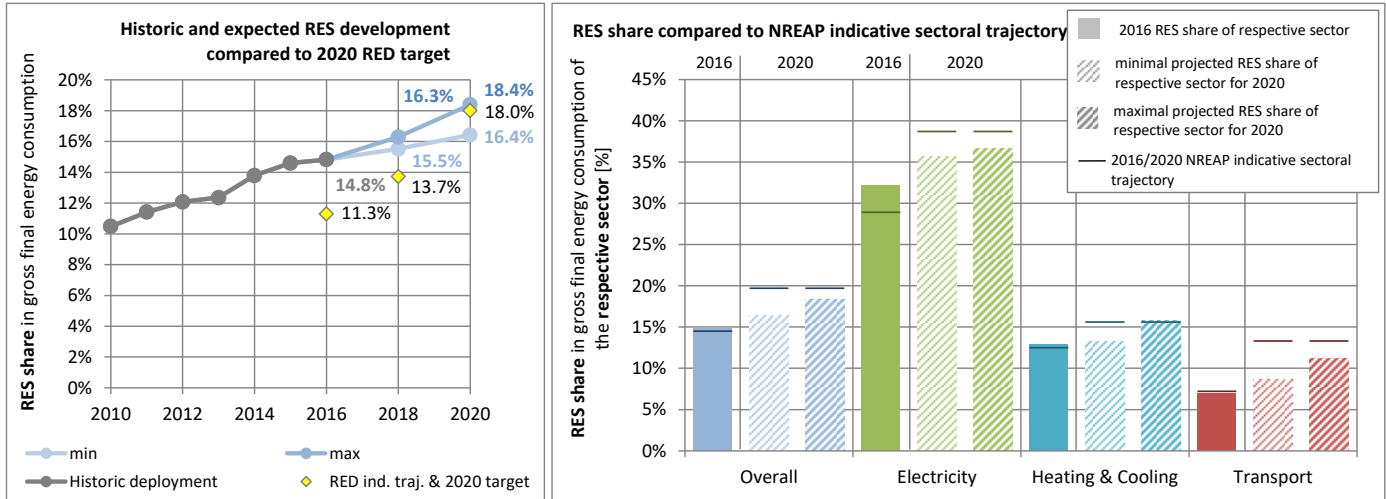
- High cost of land challenges the business model of new solar heating plants
- High tax obligations affect the profitability of RES-HC installations

Transport

- Conflict between RES-T policy and tax policy (broader use of green technologies and reduced use of fossil technologies will result in lower tax revenues from taxes on fossil resources)



Germany



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	14.8%	32.2%	13.0%	6.9%
2016 NREAP trajectory	14.4%	28.8%	12.4%	7.1%
2015/2016 indicative interim trajectory (set by RED)	11.3%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	15.5 - 16.3%	34.3 - 34.8%	12.5 - 14%	7.2 - 7.5%
2018 NREAP trajectory	16.7%	33.3%	13.9%	9.4%
2017/2018 indicative interim trajectory (set by RED)	13.7%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	16.4 - 18.4%	35.7 - 36.6%	13.3 - 15.9%	8.7 - 11.3%
2020 NREAP trajectory	19.6%	38.6%	15.5%	13.2%
2020 target (set by RED)	18.0%			

Target achievement: status quo and outlook

- The overall RES share in gross final energy demand is projected to be between 16.4% and 18.4% in 2020. This indicates that the 2020 RED target of 18.0% might be achieved but is at risk of being missed.
- The RES-E share is projected to stay below its sectoral NREAP trajectory by 2.0 pp to 2.9 pp while in the RES-H&C sector, meeting the sectoral indicative trajectory is possible in the best scenario. In 2016, Germany had an overall RES share of 14.8% in gross final energy demand and, therefore, met its NREAP indicative trajectory (14.4%). Only the RES-T share stayed below the 2016 NREAP sectoral trajectory (by 0.2 pp).

Main policy instruments:

- **RES-E:** A market premium scheme is the main instrument of support for most installations. The level of the market premium is determined through a tendering process. First auctions for solar PV and wind onshore took place in 2015 and 2017 respectively. Technology-specific deployment paths beyond 2020 are established for onshore wind, solar PV, biomass and wind offshore. Since 2017, PV-plants up to 100 kW on residential buildings are supported if the electricity is consumed within the building itself.
- **RES-H&C:** Investment grants are available for the installation of solar thermal energy, heat pumps and small biomass installations in existing buildings. In addition, low-interest loans support installations for heat generation from renewable energy sources. Owners of new buildings or buildings under renovation are obliged to use a share of heating and cooling produced from renewables.
- **RES-T:** Since 2015, a greenhouse gas reduction quota applicable to all fuels obliges suppliers to ensure that the GHG emission of their average fuel mix remain below a reference value. Since 2016, a bonus incentivises the purchase of electric, plug-in and hydrogen cars.

Barriers to RES deployment

Serious grid issues and moderate barriers in the support scheme design are the main barriers in Germany's electricity sector, whilst administrative issues and building and planning issues have improved over the past years. In the heating sector, serious barriers regarding support schemes can be noted and barriers in administrative issues increased. In the transport sector, barriers related to the support schemes are considered to be the most significant, followed by building and planning issues.

Electricity

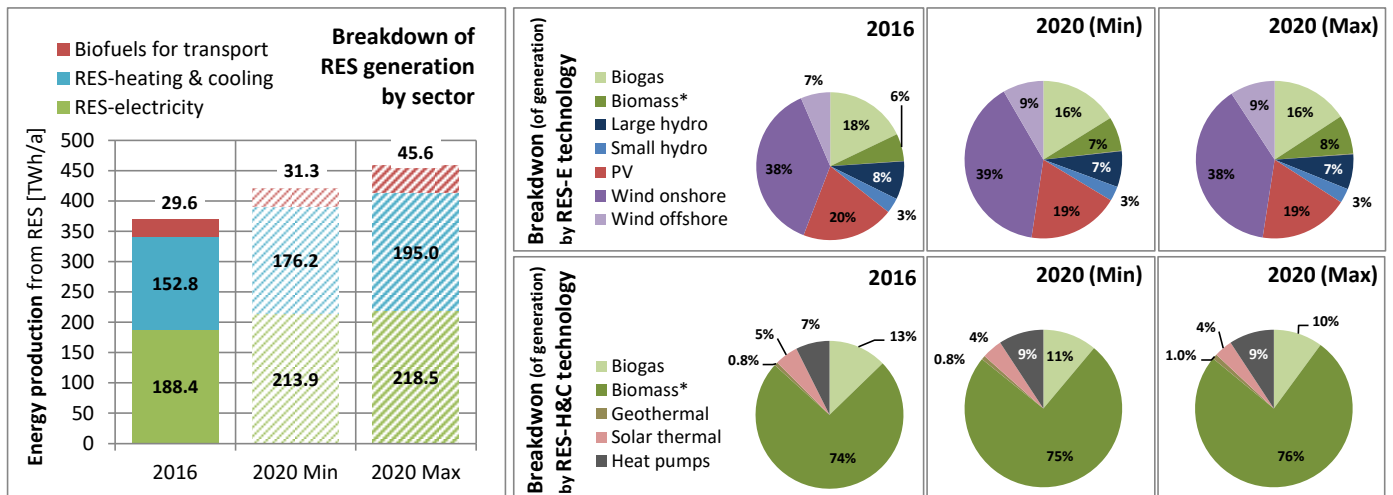
- Delayed expansion of the transmission grid, resulting in the regular occurrence of curtailment of wind plants in very suitable areas

Heating and Cooling

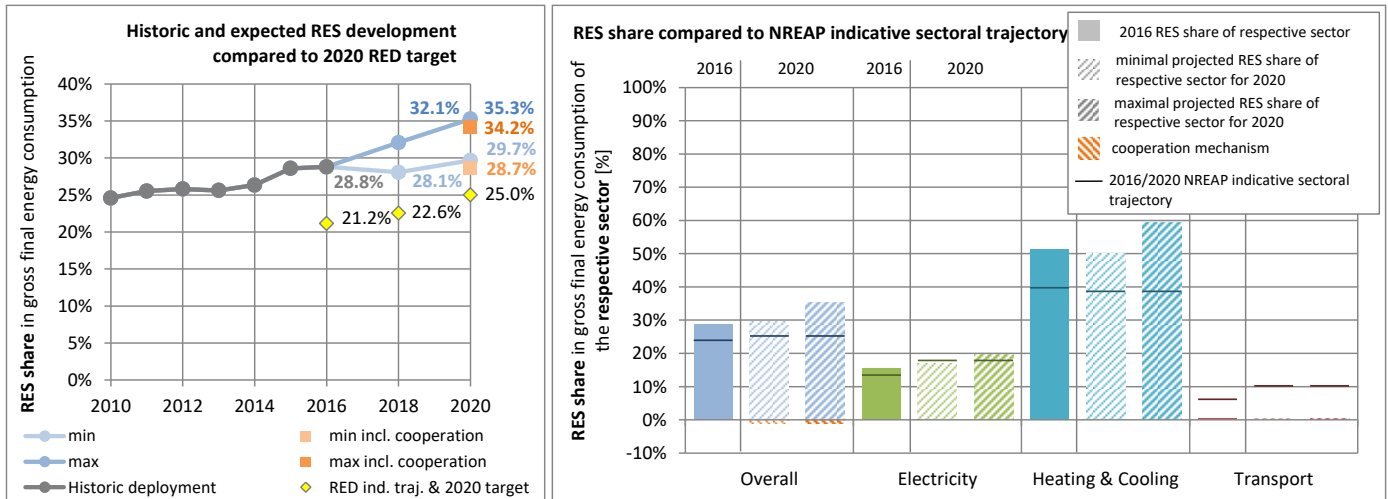
- Building obligation only limited to newly constructed buildings; exemptions possible
- No support for renewable industrial process heat

Transport

- Lack of a widespread charging network for private and public e-vehicles



Estonia



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	28.8%	15.5%	51.2%	0.4%
2016 NREAP trajectory	23.7%	13.2%	39.5%	5.9%
2015/2016 indicative interim trajectory (set by RED)	21.2%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	28.1 - 32.1%	15.6 - 17.5%	47.6 - 54.5%	0.4 - 0.5%
2018 NREAP trajectory	24.5%	16.1%	39.0%	7.8%
2017/2018 indicative interim trajectory (set by RED)	22.6%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	29.7 - 35.3%	16.9 - 19.8%	50 - 59.4%	0.4 - 0.5%
2020 projected RES share including cooperation mechanisms (min-max)	28.7 - 34.2%			
2020 NREAP trajectory	25.0%	17.6%	38.4%	10.0%
2020 target (set by RED)	25.0%			

Target achievement: status quo and outlook

- In 2016, Estonia's RES share in gross final energy demand was already 3.8 pp higher than the 2020 target level set by the RED. According to the 2020 projections, Estonia will surpass its RED target of 25% by 3.7 to 10.3 pp, depending on the addition sectoral RES deployment between 2016 and 2020, and the amount of statistical transfers to Luxembourg in the year 2020. The cooperation contract specifies a RES volume of 400 to 1000 GWh to be transferred to support the target achievement of Luxembourg in 2020.
- The main contribution to the target fulfilment is made by the RES-H&C sector, which is dominated by biomass. The country's RES-E share is projected to be in the range of 16.9% to 19.8%, which indicates that both surpassing as well as missing the 2020 NREAP sectoral trajectory for RES-E is possible. The RES-H&C sectoral NREAP trajectory is projected to be surpassed by 11.6 pp to 21 pp.

Main policy instruments:

- RES-E:** The main support scheme for electricity production is the premium tariff. All renewable technologies are eligible for support. However, some caveats exist. For example, for wind power producers, the tariff will be suspended for the current calendar year as soon as a total of 600 GWh of electricity from wind energy has been supported. The bonus amounts to €0.0537 per kWh for all technologies. This system will be gradually replaced with a new tendering-based support scheme that was adopted in June 2018. The first tender for installations with a capacity between 50 kW – 1 MW will be held in 2019.
- RES-H&C:** Several investment subsidies exist, supporting, for example, the acquisition and installation of a heating system for small residential houses, a variety of energy efficiency-related activities in apartment buildings, and promoting the use of renewable energy through investments in public buildings. The amount of the subsidy is typically 40%-70% of the projects' costs.
- RES-T:** Renewables in transportation are supported through a biofuel quota established in 2018. In addition, subsidies are paid to support an infrastructure for biomethane petrol stations, to promote biomethane use in public transport systems and to biomethane producers.

Barriers to RES deployment

The development of RES in the electricity sector in Estonia is mainly hindered by barriers dealing with support schemes and building and planning issues, alongside serious issues concerning the administrative framework. In the heating sector no further RES development is planned by the country by 2020 according to the NREAP, whilst RES development in the transport sector is severely limited by support scheme issues.

Electricity

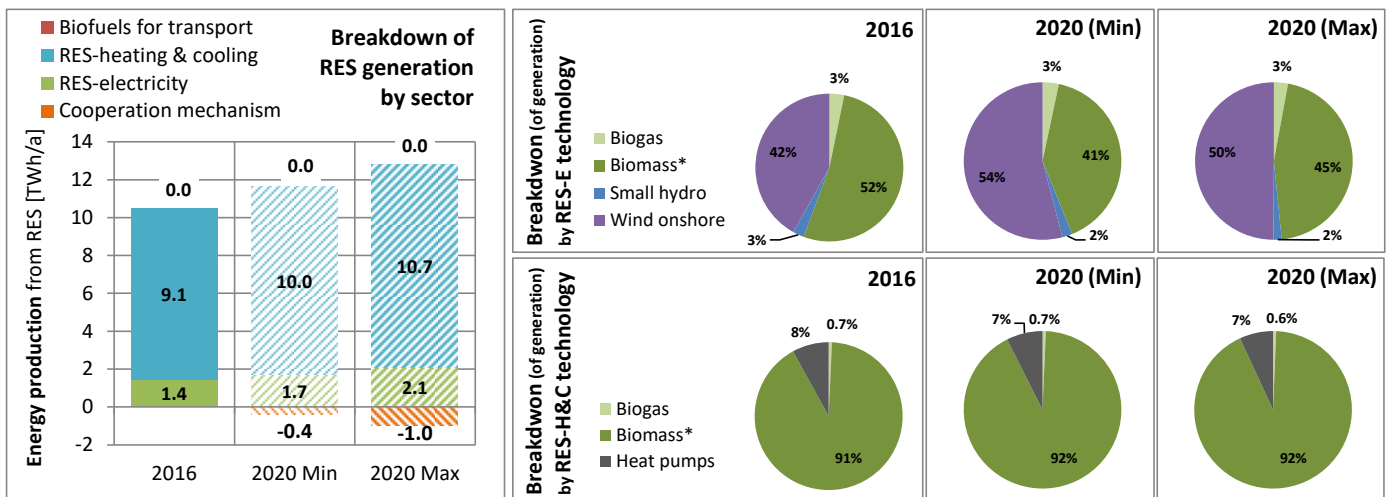
- Uncertainty regarding the implementation of the upcoming tendering-based support scheme
- Expansion of conservation areas limiting areas for RES-E development

Heating and Cooling

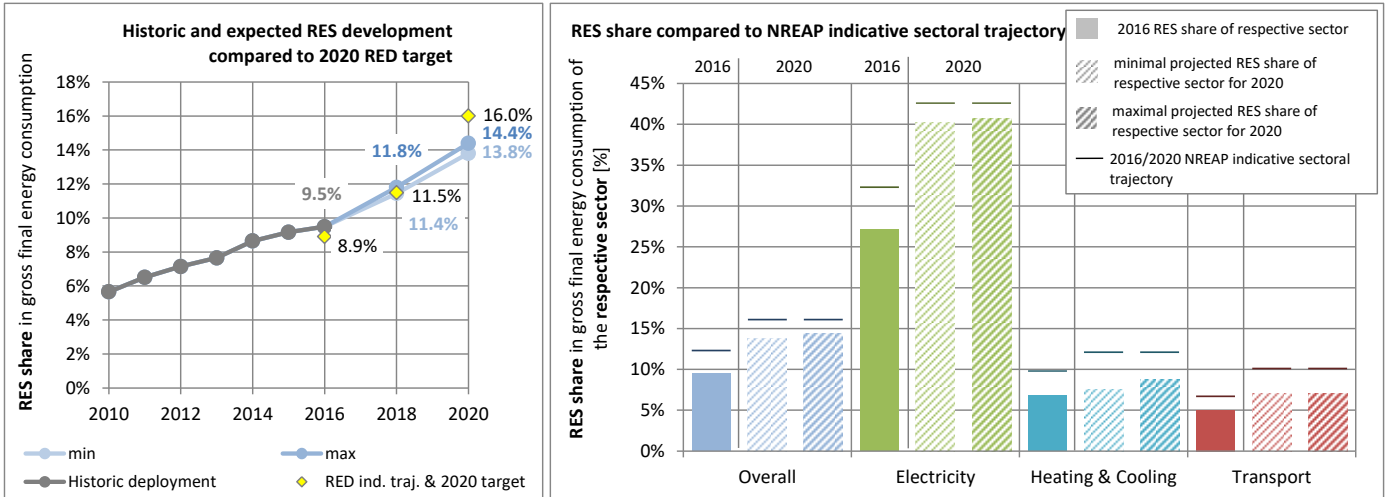
- Smaller companies do not have access to finance, due to the reluctance of banks related to the regulative uncertainty for RES-HC
- Low FiTs for district heating networks

Transport

- Uncertainty about future support schemes for biomethane



Ireland



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	9.5%	27.2%	6.8%	5.0%
2016 NREAP trajectory	12.2%	32.2%	9.7%	6.6%
2015/2016 indicative interim trajectory (set by RED)	8.9%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	11.4 - 11.8%	32.2 - 33.8%	7 - 7.7%	6.5 - 6.5%
2018 NREAP trajectory	14.0%	37.5%	10.5%	8.1%
2017/2018 indicative interim trajectory (set by RED)	11.5%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	13.8 - 14.4%	40.2 - 40.7%	7.6 - 8.7%	7.1 - 7.1%
2020 NREAP trajectory	16.0%	42.5%	12.0%	10.0%
2020 target (set by RED)	16.0%			

Target achievement: status quo and outlook

- Ireland is projected to reach an overall 2020 RES share of around 13.8% to 14.4%, which is below the 2020 RED target of 16%. Hence, Ireland should take additional policy measures and consider the use of statistical transfer to reach its 2020 RED target.
- The RES-E sector is expected to stay below its sectoral 2020 NREAP trajectory by 1.8 pp to 2.3 pp. Onshore wind is the technology contributing the most to this share and is also expected to gain importance. The RES-H&C sector is also projected to stay below the sectoral NREAP trajectory of 12.0% by 3.3 pp to 4.4 pp. In 2016, Ireland had an overall RES share in gross final energy demand of 9.5% and, therefore, reached its 2015/2016 RED indicative trajectory of 8.9% but missed its NREAP indicative trajectory of 12.2%.

Main policy instruments:

- RES-E:** Currently, there is no RES-E support scheme in place in Ireland. The former feed-in-tariff scheme for onshore wind energy, biomass and hydro plants has been discontinued in 2015. There were plans to replace the former scheme, but no new support measure was established in recent years. The introduction of RES auctions under a new support scheme are planned for 2019.
- RES-H&C:** The 'Better Energy Homes' programme provides an investment grant of € 1,200 to home owners for the installation of a solar thermal installation and heat pumps. A new "Support Scheme Renewable Heat", under which air-, water- and ground-source heat pumps are eligible for a grant, was introduced in August 2018.
- RES-T:** Ireland has a biofuel scheme that obliges fuel suppliers to reach a biofuel quota of 8.695% in 2018. However, this quota is not achieved. The quota is set to increase to 10% for 2019. Furthermore, a scheme supporting the purchase of electric vehicles with grants up to €5,000 per EV is in place.

Barriers to RES deployment

The development of RES in Ireland is mainly hindered by major barriers dealing with support scheme, grid, building and planning issues. The situation has worsened over the course of the analysed six years, which is mainly due to the political uncertainty of support schemes and the challenging new spatial planning requirements.

Electricity

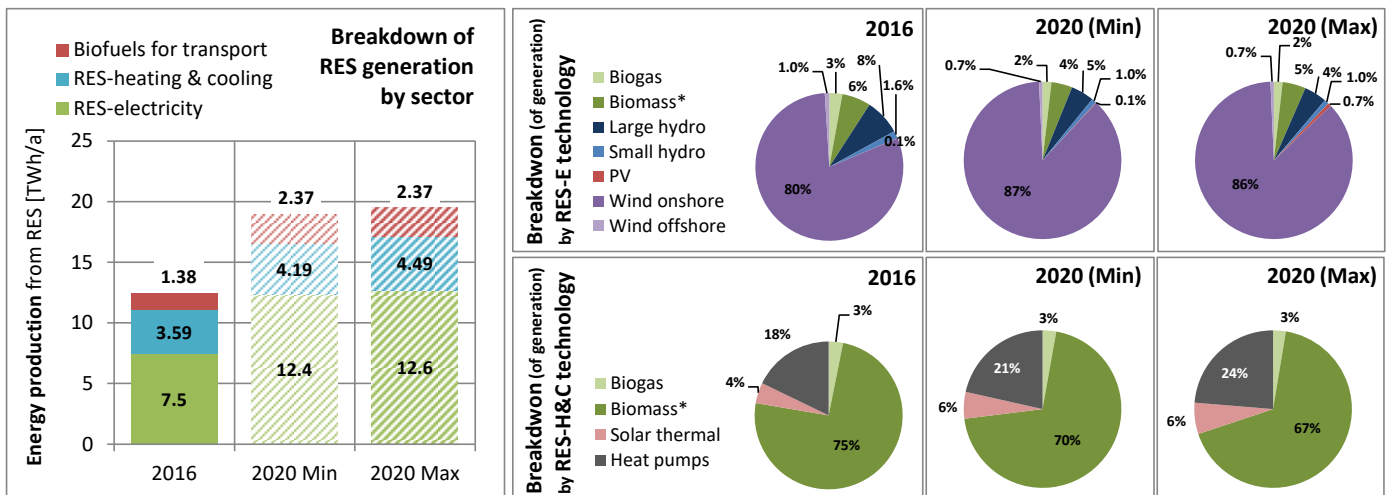
- Delayed implementation of the target model for RES installations
- Unfavourable spatial planning requirements defined in the Wind Development Planning Guidelines

Heating and Cooling

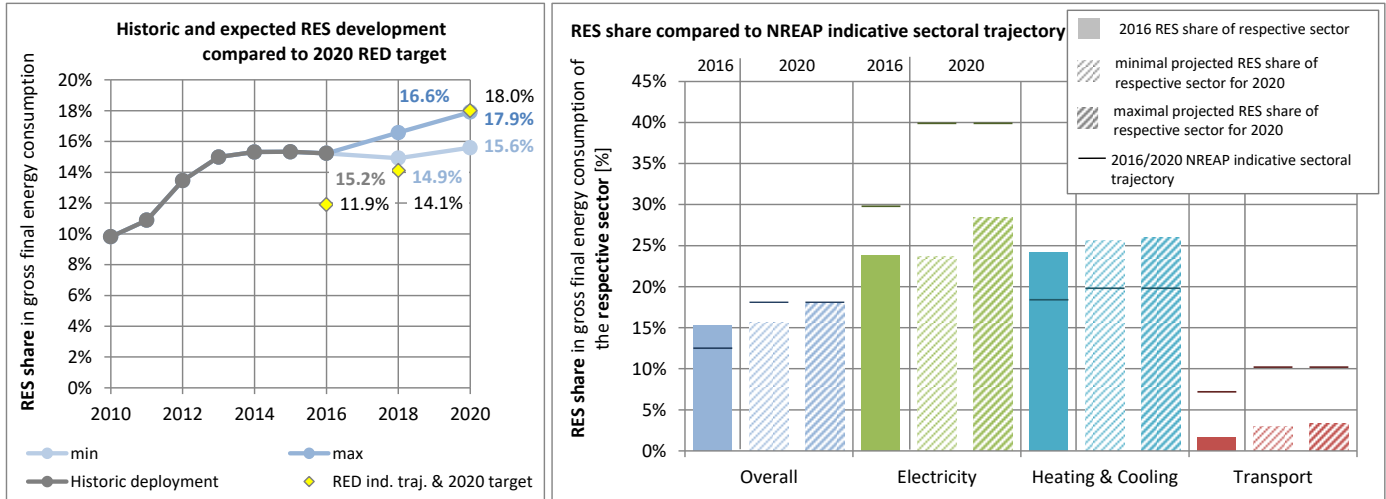
- Insufficiently developed district heating network
- Lack of a coherent and reliable support scheme for RES-HC

Transport

- Low reliability of support framework for RES-T



Greece



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	15.2%	23.8%	24.2%	1.7%
2016 NREAP trajectory	12.4%	29.7%	18.3%	7.1%
2015/2016 indicative interim trajectory (set by RED)	11.9%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	14.9 - 16.6%	23.4 - 26.6%	24.7 - 25.3%	1.8 - 2%
2018 NREAP trajectory	14.6%	33.7%	18.8%	8.6%
2017/2018 indicative interim trajectory (set by RED)	14.1%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	15.6 - 17.9%	23.6 - 28.4%	25.6 - 26%	3 - 3.3%
2020 NREAP trajectory	18.0%	39.8%	19.7%	10.1%
2020 target (set by RED)	18.0%			

Target achievement: status quo and outlook

- Greece is projected to miss its 2020 RED target of 18.0% by 0.1 pp to 2.4 pp, with an expected overall RES share of 15.6% to 17.9%. Hence, Greece should take additional policy measures to ensure reaching its 2020 RED target.
- The RES-H&C sector is expected to meet its NREAP sectoral trajectory with biomass contributing the most, followed by heat pumps and solar thermal. The RES-E sector is expected to clearly miss its sectoral NREAP trajectory by 11.4 pp to 16.2 pp in 2020. In 2016, Greece had an overall RES share of 15.2% and, therefore, overachieved its NREAP trajectory in 2016, as well as its 2015/2016 RED trajectory.

Main policy instruments:

- RES-E:** In 2016, the main RES-E policy instrument of the past, a feed-in tariff, has been replaced by a feed-in premium that is granted to installations that have successfully participated in a tendering process. RES-E installations of up to 500 kW (3 GW for wind power plants) may still receive the feed-in tariff. The first regular tender of the new system was held in July 2018. Further tenders are planned for 2019 and 2020. In addition, Greece has a net metering scheme in place for solar PV installations up to 500 kW.
- RES-H&C:** The main support measures are tax reliefs, which were introduced under the 2016 Development Law. Income tax reliefs are granted to companies for CHP plants and RES H&C plants. In March 2018, an additional programme was introduced to support the installation of solar thermal installations and heat pumps for warm water in domestic houses through the provision of grants and interest-free loans. It is expected that more than 200,000 households will benefit from this programme in 2019.
- RES-T:** Greece introduced a biofuel quota, which obliges fuel suppliers to blend their fuel with a 7% share of biofuel. However, this quota is not enforced. As of 2019, bioethanol or bio ethers from biological origin should be contained in all transport fuels. The percentage is set at 1% in 2019 and 3.3% from 2020 onwards. In addition, income tax reliefs are granted to companies for the production of biofuels which are not based on edible plants.

Barriers to RES deployment

The development of RES in Greece is mainly hindered by serious and moderate barriers related to support scheme, administrative, grid, and building and planning issues. In the heating and cooling and transport sectors, information issues are considered to be additional barriers for further development. In the electricity sector, an easing of the situation can be noted, whereas the other sectors saw an intensification in the severity of the barriers over the analysed six years.

Electricity

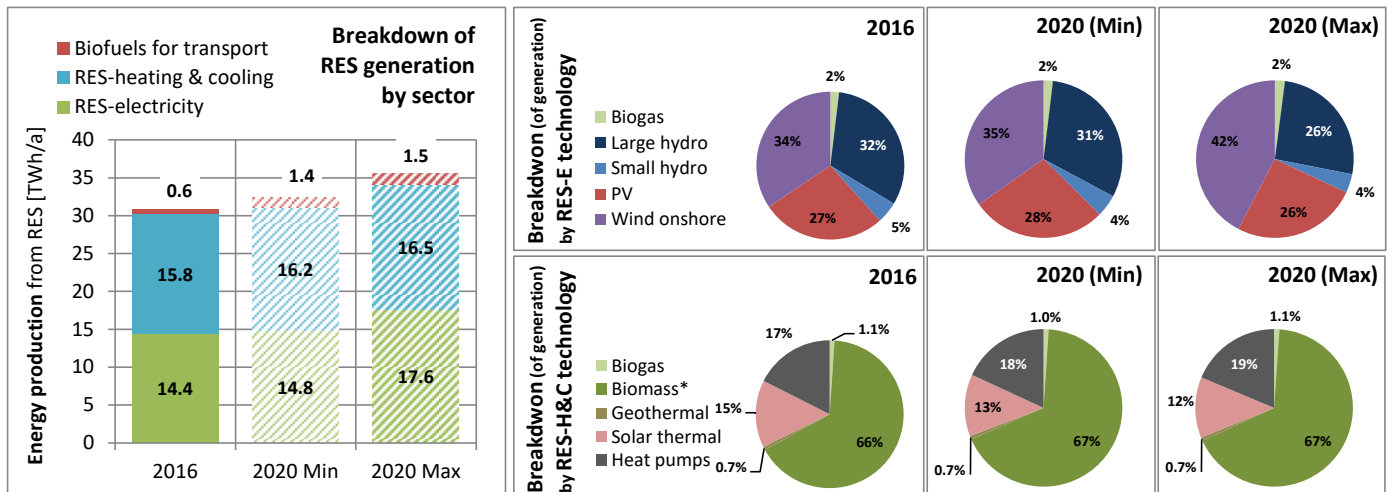
- Lack of long-term energy planning
- Long waiting periods for specific licenses e.g. generation licence
- High grid connection costs and congested grids

Heating and Cooling

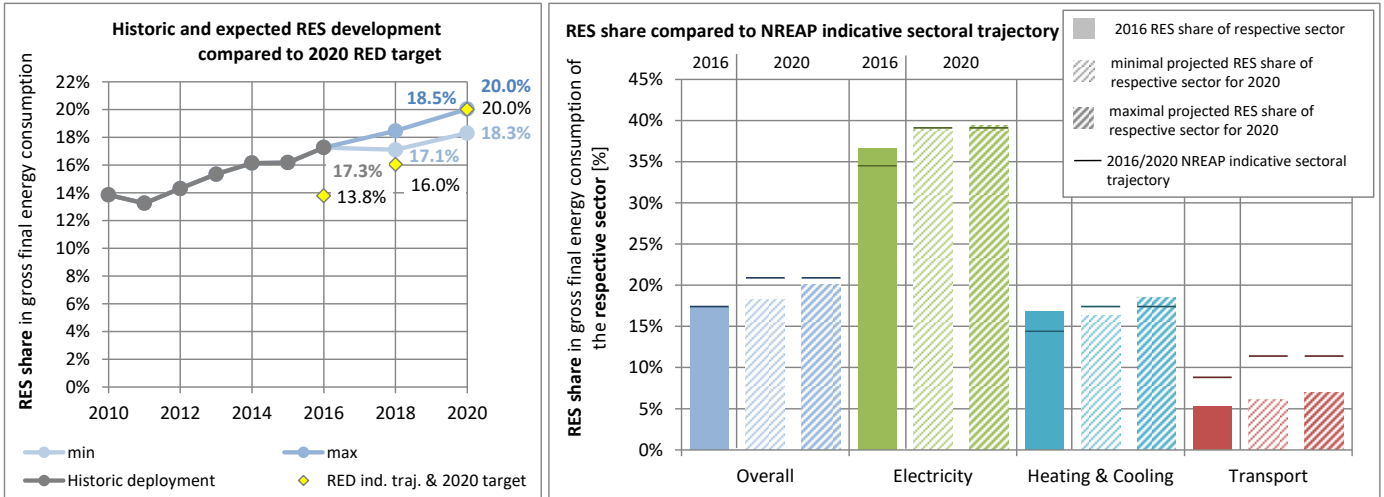
- Missing comprehensive support scheme for biomass
- Insufficient communication between the local administrations in charge of collecting data on available biomass feedstock

Transport

- Late communication of the biofuel quota by the regulator complicates the effective planning of biofuels production by interested companies (interested investors base their production on the quota distribution of the previous year)
- Lack of long-term energy roadmap impedes the deployment of RES-T



Spain



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	17.3%	36.6%	16.8%	5.3%
2016 NREAP trajectory	17.3%	34.4%	14.3%	8.7%
2015/2016 indicative interim trajectory (set by RED)	13.8%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	17.1 - 18.5%	36.5 - 37%	15.8 - 17.8%	5 - 6%
2018 NREAP trajectory	18.9%	36.4%	15.8%	9.6%
2017/2018 indicative interim trajectory (set by RED)	16.0%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	18.3 - 20%	39.1 - 39.5%	16.3 - 18.5%	6.1 - 6.9%
2020 NREAP trajectory	20.8%	39.0%	17.3%	11.3%
2020 target (set by RED)	20.0%			

Target achievement: status quo and outlook

- In Spain, the projected RES deployment and gross final energy demand for 2020 result in an overall RES share of 18.3% to 20.0%. Therefore, Spain may achieve its 2020 RED target of 20.0% in the most optimistic case. Spain should take additional policy measures to ensure reaching its 2020 RED target.
- The projections for 2020 show that the NREAP RES-E sectoral trajectory is met in any scenario and the NREAP RES-H&C sectoral trajectory is achievable depending on the scenario. Onshore wind is expected to account for about half of the RES-E sector in 2020. All NREAP indicative trajectories (except for the RES-T sectoral trajectory) were met in the year 2016.

Main policy instruments:

- RES-E:** In the course of a series of partly retroactive changes since 2012, Spain has implemented a tendering scheme, which has auctioned 8,737 MW of new capacities in 2016 and 2017. Awarded projects should be operating by 31 December 2019. Further auctions in 2019 are likely, but dates and volumes are still unclear. The Royal Decree 15/2018, validated in November 2018, increases the attractiveness of self-consumption by exempting renewable self-consumed energy from all charges.
- RES-H&C:** Currently, there is no support system for RES-H&C. However, in Spain, in some cases RES-H&C technologies are already competitive with conventional solutions, e.g. biomass in the industry and solar heating in the residential sector.
- RES-T:** Spain obliges suppliers of fuels to ensure a 6% share of biofuels in their annual fuel sales in 2018. The objectives for the penetration of biofuels have been significantly reduced in 2013. Still, the biofuel share is set to rise to 8.5% in 2020. Furthermore, Spain currently offers grants and tax reductions to support the uptake of electric vehicles.

Barriers to RES deployment

The development of RES in the Spanish electricity sector is impeded through several barriers, particularly resulting from support scheme and building and planning issues. After the abolishment of the “Special Regime” for RES in 2014 with retroactive measures, and the shortcomings of the auction round in 2016 (i.e. with the absence of pre-qualification criteria and a price set to zero), promising developments have been observed since 2017. The heating and cooling sector and the transport sector face serious issues regarding support schemes. In the former, minimal barriers on information issues have been removed, while the situation in the latter has worsened over the course of the analyzed six years. Promising measures for the transport sector are to be expected in 2019 (see section above on policy instruments).

Electricity

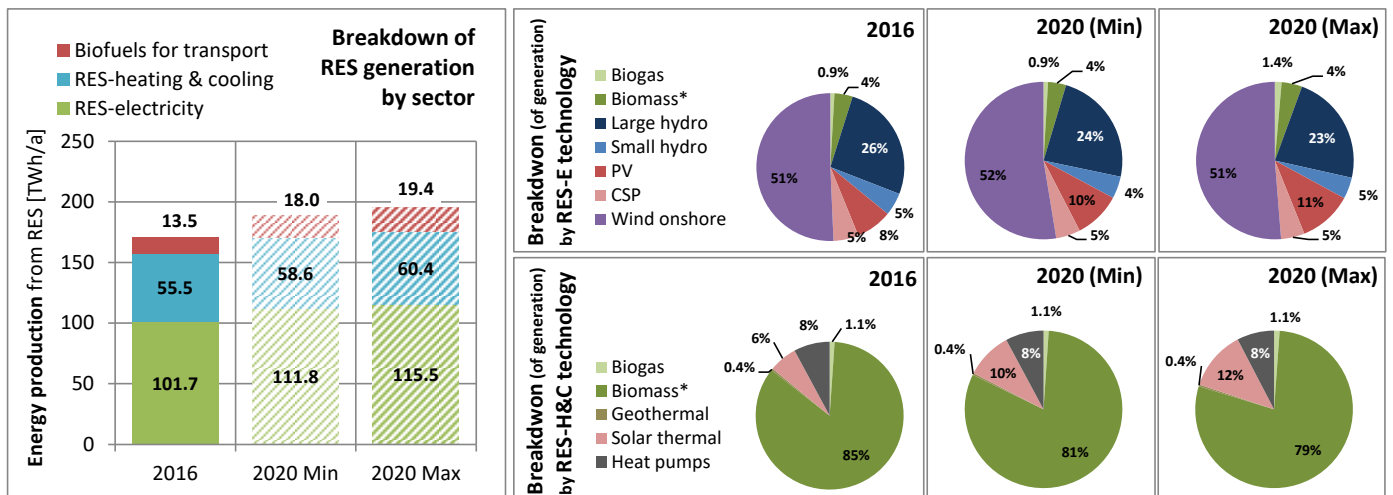
- Retroactive changes to the FiT support framework created a long-lasting insecurity amongst investors
- Long environment impact assessment procedures
- Uncoordinated legislation with large regional differences

Heating and Cooling

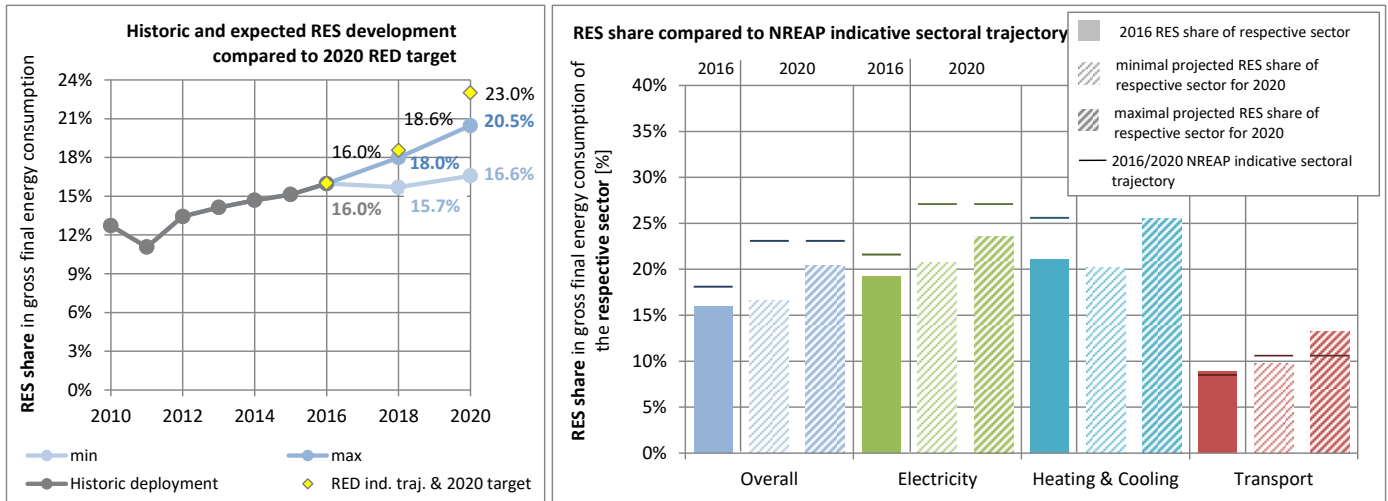
- Lack of support scheme for solar thermal installations, due to the lack of knowledge of policymakers regarding the costs of this technology

Transport

- Lowering of biofuel blending quotas
- Missing long-term stimulation of e-mobility



France



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	16.0%	19.2%	21.1%	8.9%
2016 NREAP trajectory	18.0%	21.5%	25.5%	8.4%
2015/2016 indicative interim trajectory (set by RED)	16.0%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	15.7 - 18%	19.1 - 21.8%	19.7 - 23.3%	8.7 - 9.5%
2018 NREAP trajectory	20.5%	24.0%	29.0%	9.4%
2017/2018 indicative interim trajectory (set by RED)	18.6%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	16.6 - 20.5%	20.7 - 23.5%	20.2 - 25.6%	9.7 - 13.3%
2020 NREAP trajectory	23.0%	27.0%	33.0%	10.5%
2020 target (set by RED)	23.0%			

Target achievement: status quo and outlook

- France is projected to have a 2020 overall RES share in gross final energy consumption of 16.6% to 20.5%, which means that the 2020 RED target of 23% would be missed significantly. Hence, France should take additional policy measures and consider the use of statistical transfer to reach its 2020 RED target.
- The projected RES deployment and gross final energy demand for 2020 result in an expected gap compared to the NREAP sectoral trajectories in the RES-E sector (6.3 pp to 3.5 pp), as well as in the RES-H&C sector (7.4 pp to 12.8 pp). In 2016, France missed its NREAP indicative trajectory by 2.0 pp. The RES-T was the only sector meeting the NREAP sectoral trajectory in 2016. The RED indicative trajectory 2015/16 was slightly missed.

Main policy instruments:

- RES-E:** In 2015, the French Act on Energy Transition for Green Growth re-shaped the existing support scheme, by introducing a tendering process for a feed-in premium for larger. Small RES-E installations (rooftop solar PV installations of up to 100 kW, biogas and hydro plants of up to 500 kW as well as certain wind power plants) still receive a feed-in tariff. It is expected that new technology-specific RES targets for the periods 2018-2023 and 2024-2028 will be defined in 2019.
- RES-H&C:** The main support instruments are an Energy Transition Tax Credit, reduced VAT rates and a zero-rate eco-loan. With these three measures, the French government aims to have wood-fired heating installed in 9 million dwellings, heat pumps in 2 million dwellings and solar thermal equipment in 4 million dwellings by 2020.
- RES-T:** RES-T is supported through a biofuel quota in France. Fuel suppliers are obliged to ensure a 10% share of biofuels in gasoline and 8% in diesel. Fuel suppliers are subject to increased tax rates in case they violate the biofuel obligations.

Barriers to RES deployment

The development of RES in the French electricity sector faces barriers regarding support scheme, grid, administrative, building and planning issues with a constant severity over the analysed six years. The heating and cooling sector as well as the transport sector face barriers with regards to administrative and support scheme issues. In the transport sector, the main barriers are related to support scheme issues.

Electricity

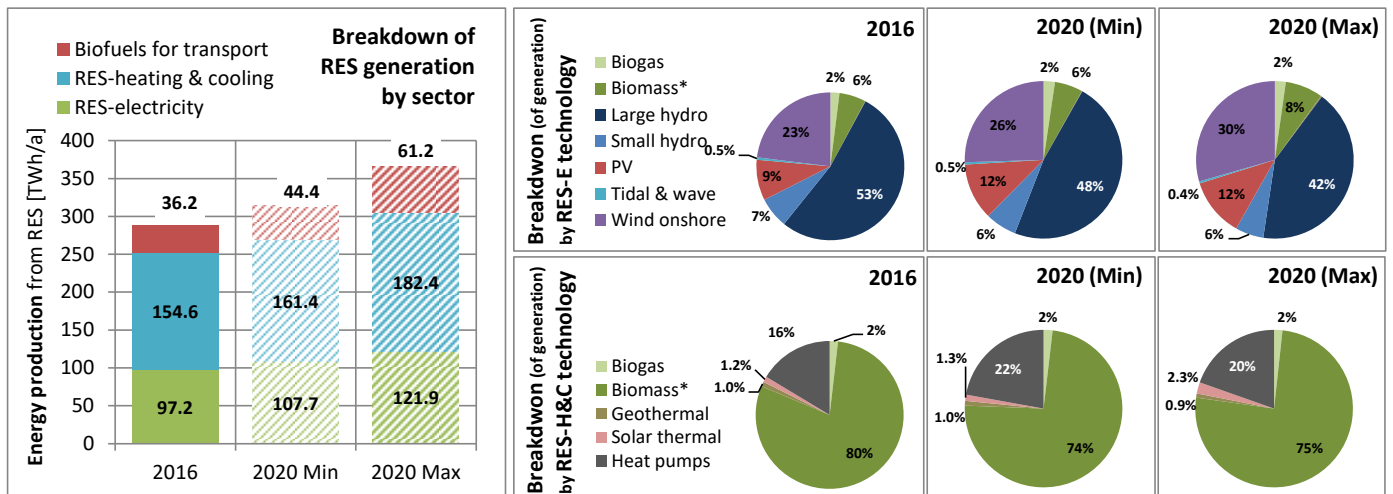
- Strong focus of the major energy utility EDF on nuclear power results in slow RES deployment
- RES developers charged for a large part of grid development costs

Heating and Cooling

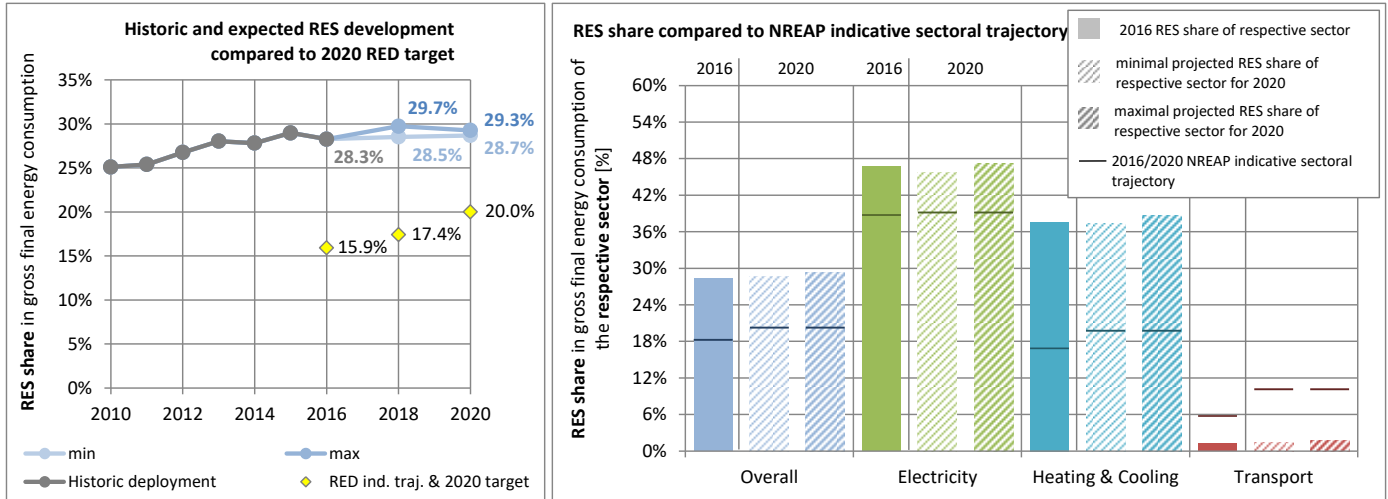
- Lack of long-term visibility of the Heat Fund, used for the financing of call for tenders for RES-HC, which is renewed every year and thus jeopardizes the planning security of investors
- Focus mainly on large projects excluding private individuals
- Competition of RES-HC technologies with electric heating appliances (over 30% of the existing individual and collective housing in France are equipped with electric heating systems)

Transport

- Freeze of biodiesel share in conventional diesel.
- The current debate at European and national level on the limitation of 1st generation biofuels creates insecurity amongst investors, thus affecting the production of biofuels. This is even more critical since investors of 1st generation biofuels are mostly the same as those of 2nd generation biofuels.



Croatia



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	28.3%	46.7%	37.6%	1.3%
2016 NREAP trajectory	18.1%	38.6%	16.7%	5.6%
2015/2016 indicative interim trajectory (set by RED)	15.9%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	28.5 - 29.7%	46.6 - 48.1%	36.8 - 41.7%	1.2 - 1.3%
2018 NREAP trajectory	19.1%	38.8%	18.2%	7.8%
2017/2018 indicative interim trajectory (set by RED)	17.4%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	28.7 - 29.3%	45.7 - 47.2%	37.4 - 38.6%	1.5 - 1.8%
2020 NREAP trajectory	20.1%	39.0%	19.6%	10.0%
2020 target (set by RED)	20.0%			

Target achievement: status quo and outlook

- Croatia is projected to have an overall RES share in gross final energy consumption of 28.7% to 29.3% in 2020. As the overall RES share in 2016 was already 8.3 pp higher than the 2020 RED target level of 20.0%, the RES growth rates – despite being low in all scenarios – are projected to be sufficient to reach the overall 2020 RED target. The projected RES-E share in 2020 is in the range of 45.7% to 47.2%, which is around the same level as in 2016.
- In 2016, Croatia had an overall RES share of 28.3% and, therefore, surpassed its sectoral NREAP indicative trajectories in RES-E and RES-H&C, which resulted in reaching the overall NREAP indicative trajectory as well. The RES-T NREAP sectoral trajectory for 2020 is projected to be clearly missed by 8.5 pp to 8.2 pp.

Main policy instruments:

- RES-E:** Croatia is currently in a transition phase between its old system based on feed-in tariffs and a new auctioning system combined with a fixed feed-in tariff for installations smaller than 500 kW and feed-in premium for installations larger than 500 kW. The new support scheme was implemented in January 2016 but has not yet been made operational. As a result, renewable energy development in the electricity sector has been put on hold. The first major by-law was eventually adopted in December 2018, and the RES Act has been amended specifying that all remaining by-laws will be enacted within six months.
- RES-H&C:** Croatia has still not introduced the regulatory framework and support scheme for promoting the deployment of RES-H&C.
- RES-T:** Croatia has a biofuel quota in place, obliging diesel fuel and gasoline distributors to place a share of biofuels on the market. However, there are difficulties in the enforcement of the quota. Financial incentives for the purchase of electric and hybrid vehicles are provided. Budgets are decided yearly.

Barriers to RES deployment

The development of RES in Croatia experiences important barriers in all sectors. In the electricity sector, barriers have increased mostly with regards to support scheme, information and administrative issues. The same negative trend related to barriers over the analysed six years can be observed in the heating and cooling as well as in the transport sector.

Electricity

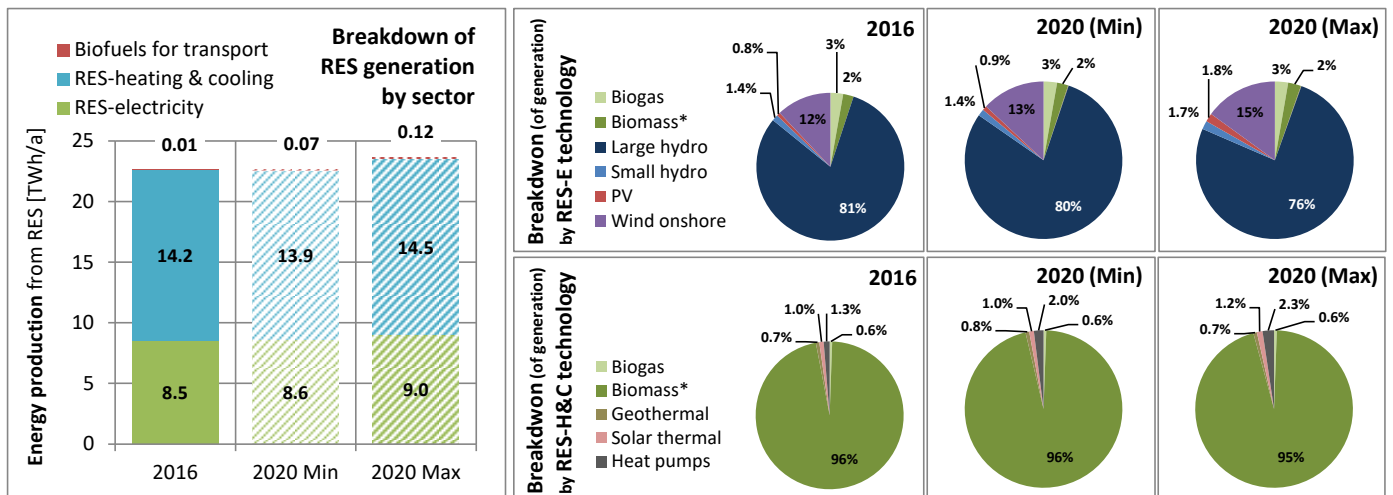
- Missing enactment of necessary by-laws of the RES Act
- High and often opaque costs of administrative procedures
- Poor identification and inclusion of favourable RES locations in spatial planning
- Costly grid connection fees

Heating and Cooling

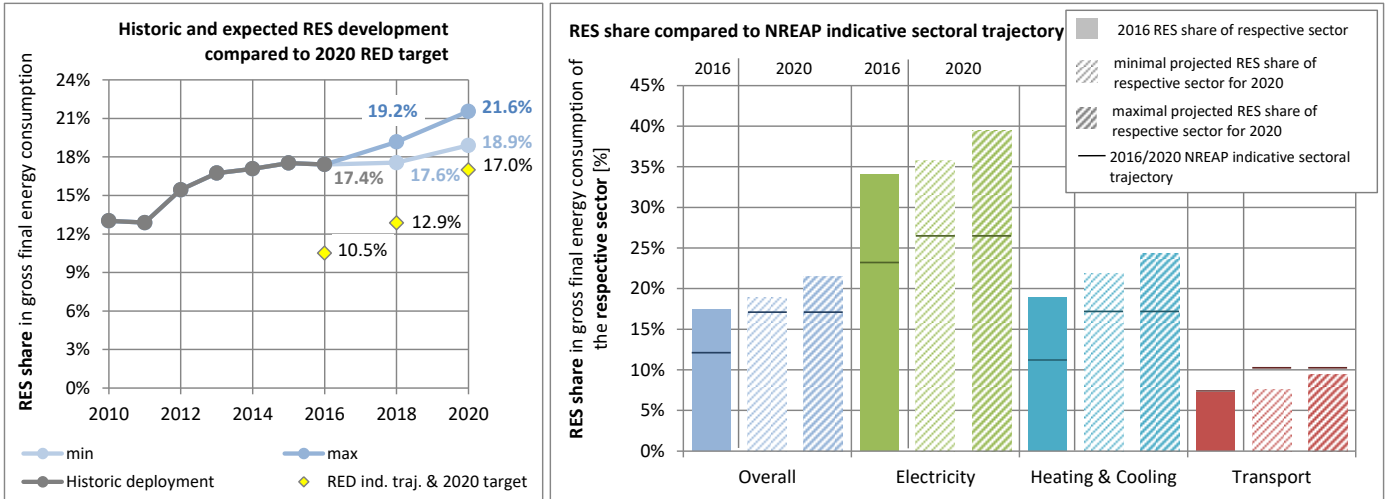
- Lack of support framework for pure RES-H&C installations
- Overly complex and numerous administrative procedures

Transport

- Lack of effective control to ensure the implementation of the legal framework stipulating the obligation for distributors of diesel fuel and gasoline to incorporate biofuels into conventional fuels.
- Lack of a regulatory framework for advanced biofuels.



Italy



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	17.4%	34.0%	18.9%	7.2%
2016 NREAP trajectory	12.0%	23.1%	11.1%	7.3%
2015/2016 indicative interim trajectory (set by RED)	10.5%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	17.6 - 19.2%	34.5 - 36%	19.8 - 21.5%	6.7 - 7.7%
2018 NREAP trajectory	13.8%	24.6%	13.6%	8.7%
2017/2018 indicative interim trajectory (set by RED)	12.9%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	18.9 - 21.6%	35.8 - 39.5%	21.9 - 24.4%	7.5 - 9.4%
2020 NREAP trajectory	17.0%	26.4%	17.1%	10.1%
2020 target (set by RED)	17.0%			

Target achievement: status quo and outlook

- Italy is projected to have a 2020 overall RES share in gross final energy consumption ranging between 18.9% and 21.6% and is therefore projected to meet the 2020 RED target of 17.0%.
- In 2016, Italy had already an overall RES share which was 0.4 pp higher than its 2020 RED target level of 17.0%. Only in the RES-T sector, it missed its NREAP indicative trajectory by 0.1 pp. In 2020, both the RES-E and the RES-H&C sectors are projected to surpass their sectoral NREAP trajectories. In the RES-E sector, photovoltaic electricity has gained importance and makes a main contribution – together with onshore wind and large hydropower.

Main policy instruments:

- RES-E:** RES-E has been promoted through a number of feed-in tariffs and premiums since 2013. Prior to 01.01.2018, installations above 5 MW had to compete in a tendering process, however, this support scheme is no longer in place. The government is currently working on a new decree that is to be issued shortly. Additionally, net metering and tax regulation mechanisms are available. Italy's green certificate scheme was abolished in 2016, along with the accompanying quota scheme.
- RES-H&C:** Since 2016, small RES-H sources such as heat pumps, biomass and solar thermal are eligible for financial support that is provided annually, or all at once when the level of eligible support does not exceed €5,000. Both private individuals and public entities are eligible. In addition, tax deductions support energetic refurbishments of buildings and the installation of RES-H&C technologies.
- RES-T:** The main instrument to increase the RES-T share in Italy is a quota system for biofuels. The goal set out is a share of 9% biofuels by 2020. The scope of fuels is relatively broad, with biodiesel, bioethanol and derivatives, bio hydrogen and ETBE being eligible. As of 2015, Italy exempts owners of electric vehicles from ownership tax for a period of 5 years, where after a reduced rate applies.

Barriers to RES deployment

The development of RES in Italy's electricity sector faces serious barriers related to grid, support scheme and administrative issues. Obstacles regarding building and planning, as well as administrative issues, have been partially removed over the analysed six years. Barriers in the heating and cooling sector are mainly administrative, information and support scheme issues, which worsened over the last years. In the country's transport sector, information issues are considered to be the main barriers.

Electricity

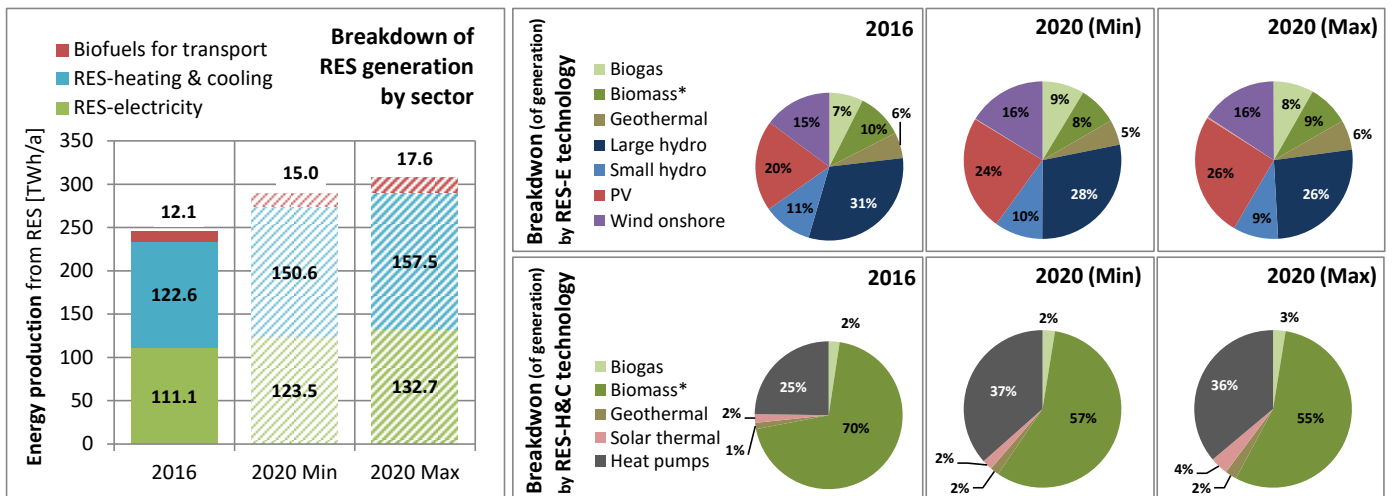
- Lack of long-term visibility and attractiveness of support schemes
- Retroactive legislative changes affecting PV
- Long and unclear grid connection procedures

Heating and Cooling

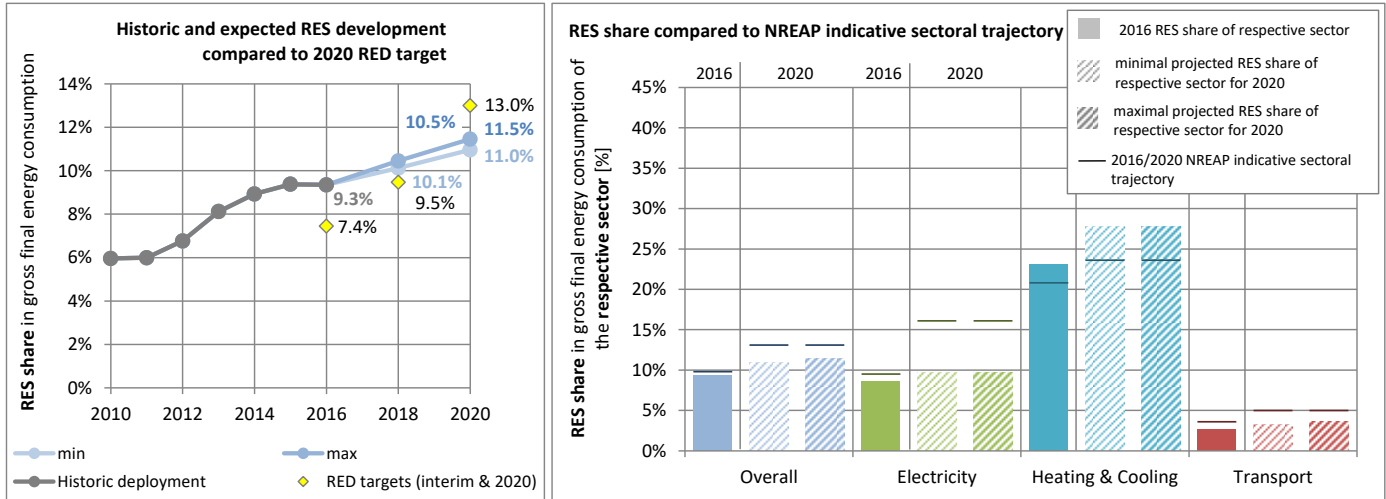
- Inconsistencies between the relevant regulations related to heating and cooling
- Lack of information for individual private project developers
- Lengthy administrative processes due to too many involved authorities RES-H&C

Transport

- Poor flow of information on suitable support schemes from policies to project implementation



Cyprus



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	9.3%	8.6%	23.0%	2.7%
2016 NREAP trajectory	9.7%	9.4%	20.7%	3.5%
2015/2016 indicative interim trajectory (set by RED)	7.4%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	10.1 - 10.5%	9 - 9.4%	25.5 - 26.2%	2.4 - 2.7%
2018 NREAP trajectory	11.2%	12.4%	22.1%	4.2%
2017/2018 indicative interim trajectory (set by RED)	9.5%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	11 - 11.5%	9.7 - 9.7%	27.8 - 27.8%	3.2 - 3.6%
2020 NREAP trajectory	13.0%	16.0%	23.5%	4.9%
2020 target (set by RED)	13.0%			

Target achievement: status quo and outlook

- The projected RES share for Cyprus in 2020 is 1.5 pp to 2.0 pp below the 2020 RED target of 13%. Hence, Cyprus should take additional policy measures and consider the use of statistical transfer to reach its 2020 RED target.
- The RES-E and RES-T sectors are projected to be below the 2020 NREAP trajectories. In contrast, the RES share in the H&C sector is expected to surpass its sectoral NREAP trajectory by 4.3 pp in 2020. Cyprus missed its 2016 NREAP indicative trajectory by 0.4 pp but surpassed its 2015/2016 indicative RED trajectory.

Main policy instruments:

- RES-E:** In 2015, Cyprus decided to phase out its feed-in-tariff to integrate renewable plants into the competitive electricity market in the long-term. As soon as the electricity market starts operating – expected by 2020 – RES-E plants will only receive the electricity market price. In the transitional phase, new installations receive administratively set feed-in tariffs. In June 2018, a new net-metering scheme was announced. Similar to the previous net-metering scheme, PV systems up to 10 KW are eligible.
- RES-H&C:** Cyprus has two grant schemes in place. The first one offers an investment grant for solar water heaters for residential buildings as well as enterprises until January 2018. The second scheme (“Energy Upgrading of Domestic Residences”) provides grants for the purchase and installation of certain technologies (solar thermal, geothermal, hydrothermal and aerothermal heat pumps).
- RES-T:** Fuel suppliers are obliged to replace conventional transport fuels with biofuels (quota). The quota is currently set at 2.4%, which is too low to achieve the RES-T target. Additional measures are expected in 2019.

Barriers to RES deployment

The Cypriot RES sectors are characterized by barriers related to administrative and information issues. In the electricity sector, building and planning as well as support scheme issues are further complicating the deployment of additional RES capacity. The administrative hurdles increase insecurity amongst investors. All sectors have experienced an increase in barrier severity further hindering the RES deployment on the island. Grid issues are the only exception, which gradually improved over the course of the last years.

Electricity

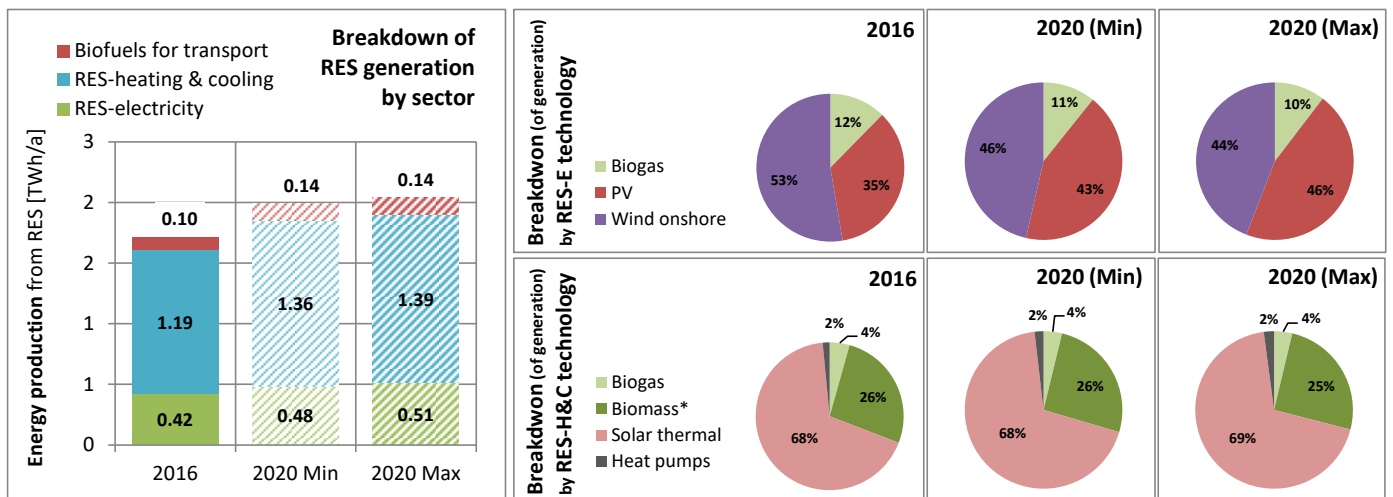
- Lack of streamlining for permitting procedures
- High administrative fees reduce the profitability of RES projects

Heating and Cooling

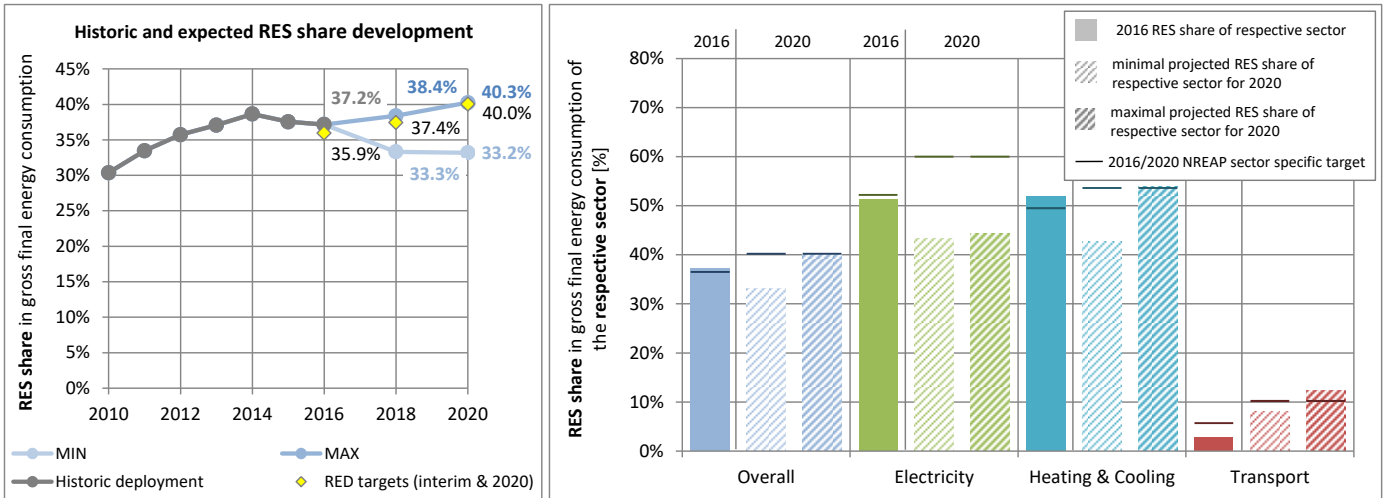
- Lack of communication and cooperation between the different administrative institutions
- Competencies in renewable energies are split across a large number of institutions

Transport

- Insufficient implementation and enforcement of biofuel quota



Latvia



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	37.2%	51.3%	51.9%	2.8%
2016 NREAP target	36.3%	52.0%	49.3%	5.5%
2015/2016 interim target set by RES directive	35.9%			
2018 projected RES share in sectoral gross final energy consumption (Min-Max)	33.3 - 38.4%	44.4 - 45.9%	45.1 - 52.7%	3 - 7.5%
2018 NREAP target	37.7%	55.2%	50.6%	7.2%
2017/2018 target set by RES directive	37.4%			
2020 projected RES share in sectoral gross final energy consumption (Min-Max)	33.2 - 40.3%	43.2 - 44.2%	42.8 - 54%	8 - 12.3%
2020 NREAP target	40.0%	59.8%	53.4%	10.0%
2020 target set by RES directive	40.0%			

Target achievement: status quo and outlook

- Latvia's overall RES share in gross final energy demand 2020 is projected to range between 33.2% and 40.3%. Thus, reaching the 2020 RED target of 40.0% is only possible in the most optimistic scenario. Latvia should take additional policy measures to ensure reaching its 2020 RED target.
- In 2020, the country is projected to miss its RES-E NREAP sectoral trajectory by 15.6 pp to 16.6 pp with shares which might be even lower than the RES-E share in 2016. This is partly due to an expected increase in gross electricity demand. In 2016, Latvia had a share of 37.2% in gross final energy demand, which was higher than its 2016 NREAP indicative trajectory and the 2015/2016 RED indicative trajectory.

Main policy instruments:

- RES-E:** Electricity generation from RES is supported through a complex support system based on a feed-in tariff, which also includes elements of a quota system and tenders. Since 2011 – in the case of cogeneration plants, end of 2012 – the existing support scheme has been closed for new installations until 1 January 2020 due to disproportionately high costs reflected in the electricity prices for final consumers. The Latvian government has introduced additional measures to reduce the high costs for support schemes. Since 1 January 2014, net-metering of RES-E fed-in to the grid through small-scale connections has been in place.
- RES-H&C:** Two tax regulation mechanisms for biomass and biogas heating are in place: a value added tax reduction for fuelwood for household consumption, and an excise tax reduction for biogas. Moreover, renewable heat is supported with other fiscal measures, such as investment support in the installation of new renewable energy heat plants in district heating, as well as investment support in replacement of fossil sources with renewable energy in state owned buildings, multi-apartment buildings and industry.
- RES-T:** The mandatory admixture of 4.5 - 7% biofuel in fossil fuel is the main instrument in force. Work is ongoing to introduce a new mechanism for a mandatory share of renewable energy in the fuel suppliers' energy mix. Moreover, measures to support electric mobility have been put in place, such as grants for electric vehicles and subsidies for charging infrastructure.

Barriers to RES deployment

Latvia has a high share of RES, mainly due to large hydro power capacities. In the past ten years, however, the Latvian government has struggled to expand that positive starting position. According to the NREAP, the achievement of the 2020 target shall largely rely on ambitious deployment of new onshore and offshore wind as well as solid biomass capacities. However, there has been no active support scheme for newly initiated projects since the old scheme was put on hold in 2012 to keep the costs for RES-e deployment under control. The lack of support has hindered the deployment of RES-E capacities since then. In addition, the developers of RES-E projects have to bear all costs related to the connection of RES-E installations to the grid. The main focus of the Latvian government with regard to heating and cooling is on energy efficiency and investment in district heating, rather than on RES. Consequently, the national strategy for heating, and its implementation policy, does not enhance further progress in renewable heating and cooling. RES in the transport sector has suffered from incoherent and short-term policy plans and strategies, which were often not continued. However, political actions that took place at the end of 2018 might improve the situation.

Electricity

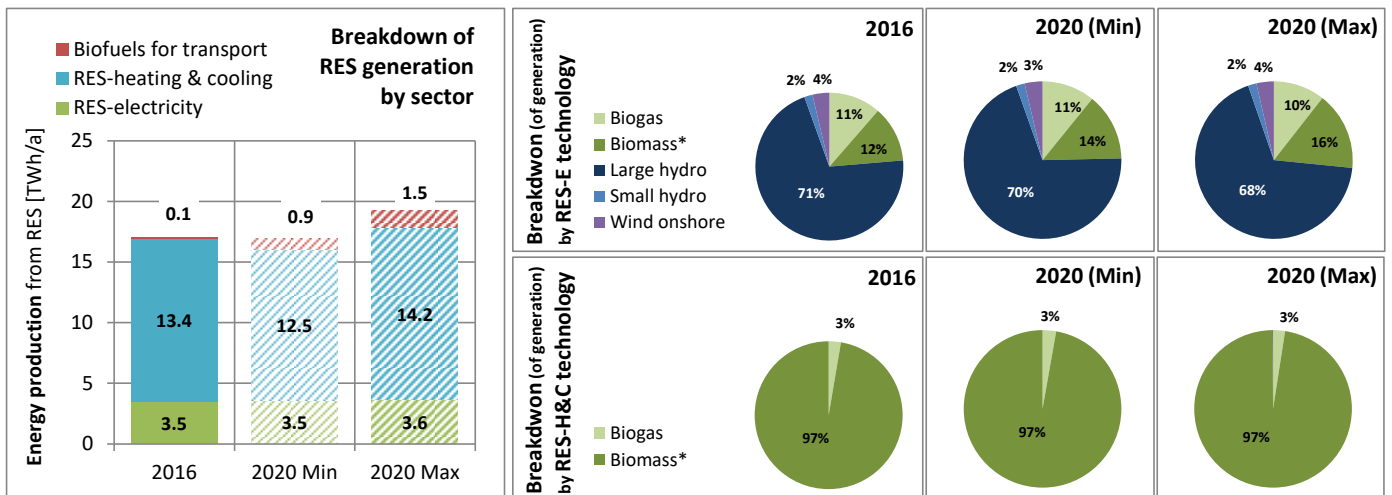
- Suspension of the former FiT/tender scheme and quota system
- Unbalanced distribution of grid access costs

Heating and Cooling

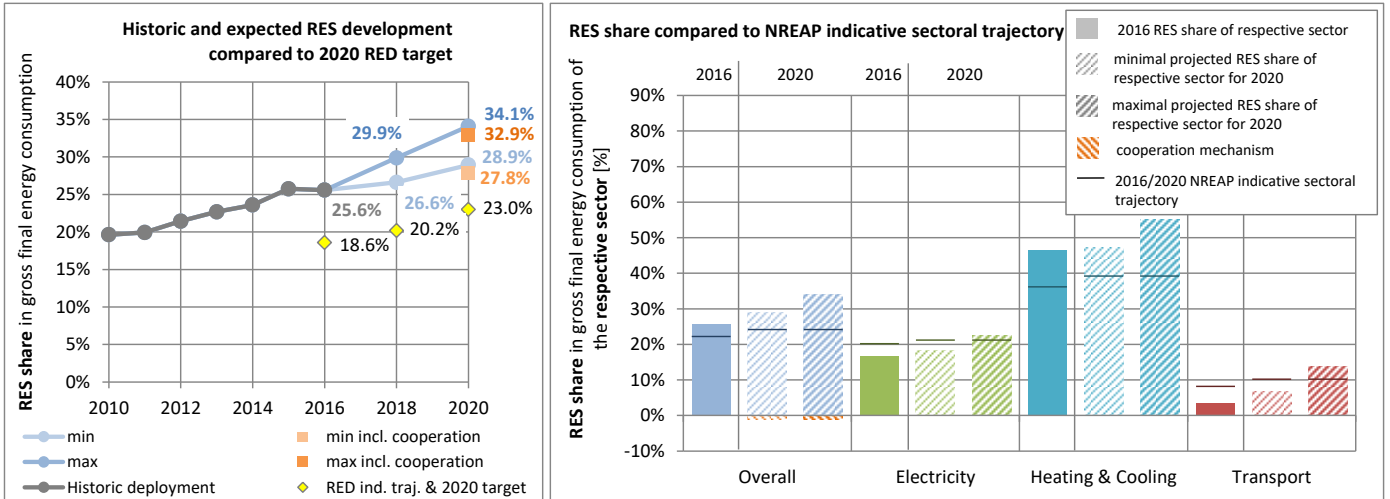
- Lack of a sufficient overall political strategy at national level due to prioritization of energy efficiency
- The targets and proposed steps in the Energy Strategy 2030 are not legally binding

Transport

- Slow development of e-mobility due to the lack of permanent support scheme for hybrid and electric cars
- Slow uptake of biofuels including advanced biofuels



Lithuania



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	25.6%	16.8%	46.5%	3.6%
2016 NREAP trajectory	22.0%	20.0%	36.0%	8.0%
2015/2016 indicative interim trajectory (set by RED)	18.6%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	26.6 - 29.9%	16.7 - 20.3%	44 - 50.9%	4.9 - 7.8%
2018 NREAP trajectory	24.0%	22.0%	39.0%	10.0%
2017/2018 indicative interim trajectory (set by RED)	20.2%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	28.9 - 34.1%	18.4 - 22.7%	47.3 - 55.2%	6.7 - 13.7%
2020 projected RES share including cooperation mechanisms (Min-Max)	27.8 - 32.9%			
2020 NREAP trajectory	24.0%	21.0%	39.0%	10.0%
2020 target (set by RED)	23.0%			

Target achievement: status quo and outlook

- In Latvia the projected range of RES in gross final energy consumption 2020 is between 27.8% and 34.1%, depending on the additional RES deployment between 2016 and 2020 and the amount of statistical transfers to Luxembourg. Lithuania has signed a contract to transfer at least 700 GWh of RES statistically to support the target achievement of Luxembourg in 2020.
- Lithuania had a share of 25.6% in gross final energy demand in 2016. That means that the country already had a higher RES share in 2016 than its 2020 RED target level of 23.0%. The main contribution comes from the RES-H&C sector, with biomass forming almost the entire renewable share of the H&C sector. Depending on the scenario, the RES-E sector is projected to be slightly above or below its sectoral NREAP indicative trajectory for 2020 (range of 1.7 pp above to 2.6 pp below).

Main policy instruments:

- **RES-E:** The main support instrument is a sliding feed-in premium. Installations below 10 kW receive administratively set support payments; installations above 10 kW receive the premiums through technology-specific tenders. Currently, a new support scheme incorporating technology-neutral tenders for sliding feed-in premiums is under discussion, as technology-specific volume caps of the current scheme had already been reached in 2015. In addition, RES-E installations benefit from reduced grid connection and investment grants (for industrial RES-E producers). Small installations are eligible for net-metering.
- **RES-H&C:** Biogas production is supported via a feed-in tariff. Small-scale biofuel cogeneration and the modernization of fossil-fueled house-boilers benefit from investment aid. Exemptions from the Environmental Pollution tax for biogas and biomass plants exist.
- **RES-T:** A biofuel quota of at least 5% for petrol and at least 7% for diesel exists. Moreover, a subsidy on raw materials for biofuel production, as well as exemptions from excise and environmental pollution tax for biogas, are in place.

Barriers to RES deployment

The RES deployment in Lithuania is hampered by barriers dealing with information, support scheme, and building and planning issues in all three energy sectors. In the electricity sector, a slight increase can be noted in the severity of the barriers related to administrative and building and planning issues, resulting from more complex permitting procedures. Another major issue are the technology caps, which led to a halt in tenders after the caps had been reached. A similar negative dynamic in barrier severity can be observed in the heating and cooling and transport sectors. Here, the situation on information issues and the legal framework related support schemes has worsened over the last years.

Electricity

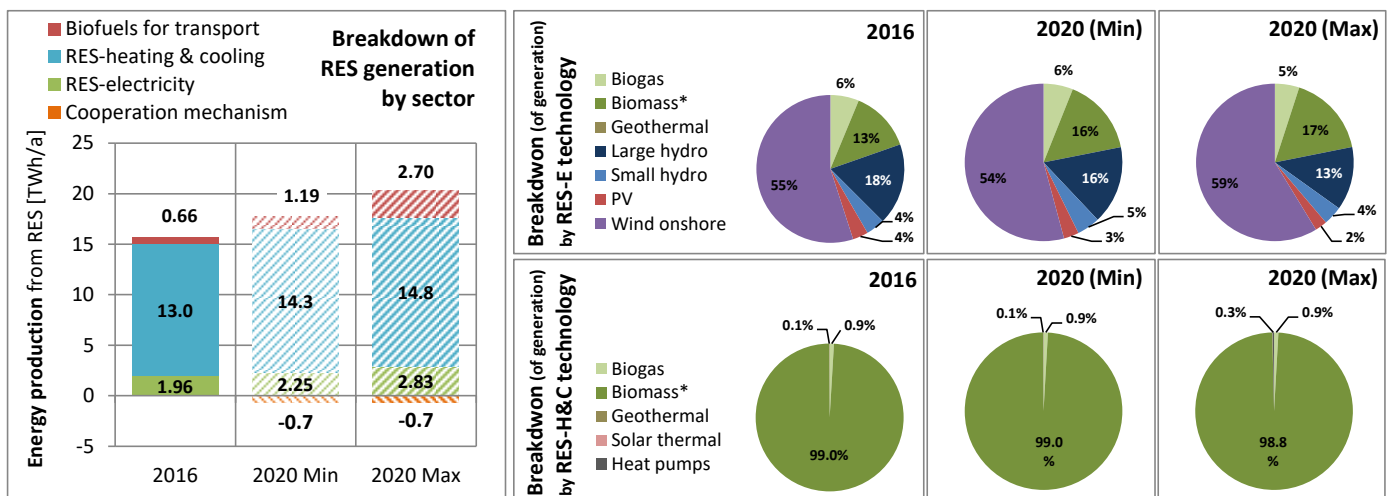
- Technology caps within the tender-FiT programme hinders the deployment of RES
- The New National Energy Independence Strategy lacks specific measures to reach RES targets

Heating and Cooling

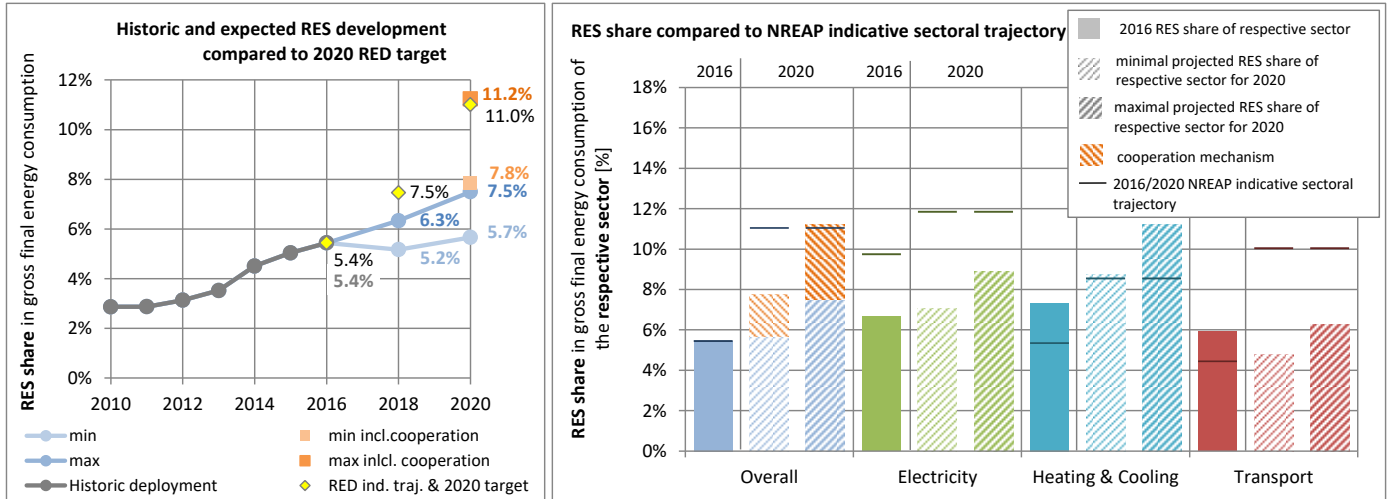
- The New National Energy Independence Strategy lacks specific measures to reach RES targets
- Scattered competencies for RES across several ministries
- Lack of support scheme for the replacement of old wood-fired boilers

Transport

- Scattered competencies across several public institutions
- Absent legal framework to support e-mobility



Luxemburg



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	5.4%	6.7%	7.3%	5.9%
2016 NREAP trajectory	5.4%	9.7%	5.3%	4.4%
2015/2016 indicative interim trajectory (set by RED)	5.4%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	5.2 - 6.3%	6.7 - 7.6%	7.8 - 9.3%	4.5 - 5.6%
2018 NREAP trajectory	7.5%	11.1%	6.8%	6.5%
2017/2018 indicative interim trajectory (set by RED)	7.5%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	5.7 - 7.5%	7.1 - 8.9%	8.7 - 11.2%	4.8 - 6.3%
2020 projected RES share including cooperation mechanisms (Min-Max)	7.8 - 11.2%			
2020 NREAP trajectory	11.0%	11.8%	8.5%	10.0%
2020 target (set by RED)	11.0%			

Target achievement: status quo and outlook

- Luxembourg is projected to achieve a 2020 RES share of 5.7% to 7.5% domestically and to make use of statistical transfers from Estonia and Lithuania. Including these volumes of at least 1.1 TWh to up to 1.7 TWh, Luxembourg is expected to reach an RES share of 7.8% to 11.2%. Thus, in the best-case scenario, it would achieve its 11% RED target in 2020.
- In 2016, Luxembourg had an overall RES share in gross final energy demand of 5.4% which was exactly the country's 2016 NREAP indicative trajectory. The 2015/2016 RED indicative trajectory was slightly missed due to a lower RES share in 2015. The RES-H&C sector is the only sector which is expected to reach the NREAP sectoral trajectory by 2020, with biomass making the main contribution.

Main policy instruments:

- **RES-E:** The main RES-E support instruments in Luxembourg are feed-in-tariffs and floating feed-in premiums. In addition, four types of investment grants for RES-E installations are in place. Moreover, Luxembourg launched a tender scheme for solar PV exceeding 500 kW in 2018. The income from the sale of electricity generated by photovoltaic installations with a capacity of 1 - 4 kW is exempt from income tax.
- **RES-H&C:** Installations are supported by different types of investment grants ranging from 25% to 50% of investment costs. Eligible technologies are heat pumps, geothermal energy, biomass and solar thermal energy.
- **RES-T:** Biofuels are supported through a quota, according to which the share of biofuel in fuel companies' annual sales of petrol and diesel must be at least 5.4%. In case a quota is missed, a pollution tax must be paid.

Barriers to RES deployment

In Luxemburg, the electricity sector faces various barriers regarding support scheme, grid, and building and planning issues. However, the situation for support schemes improved when the country introduced a support programme for PV in 2018. Nevertheless, limited support programs in the transport sector, along with inadequate ones in the heating and cooling sector, show different shortcomings in the legal framework. Additionally, information issues further complicate plans for individuals to install renewable heating systems.

Electricity

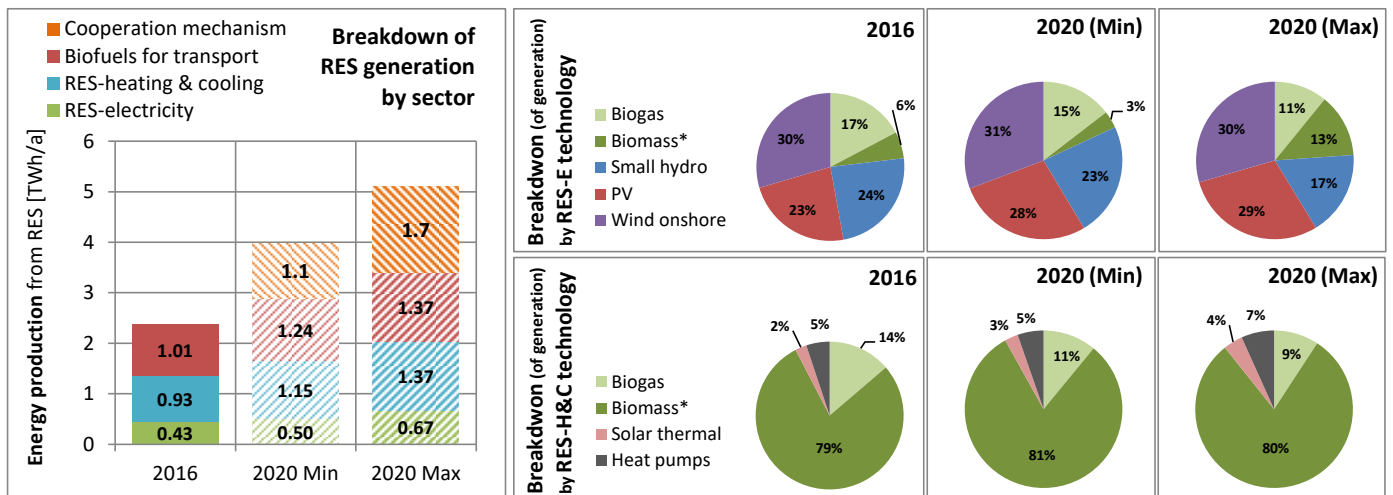
- Suitable areas for wind power still not published by the Ministry of Sustainability
- Non-existence of sectoral plans for RES-E

Heating and Cooling

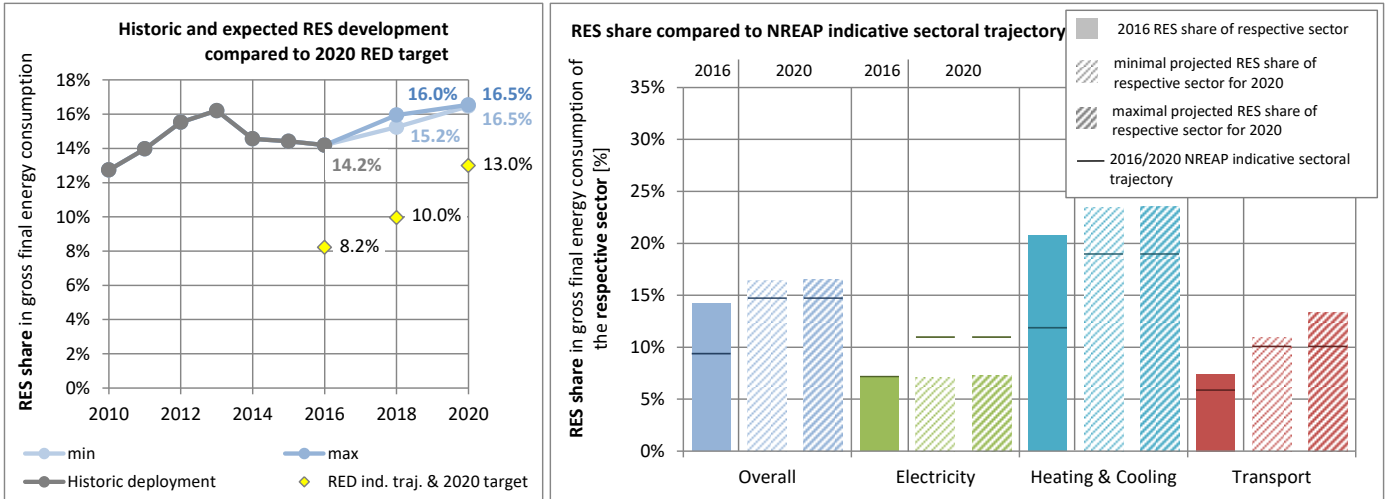
- Uncertainty of future support schemes for solar thermal technologies

Transport

- No support schemes for biofuels apart from quotas
- Complex social and ecological criteria for first generation biofuels



Hungary



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	14.2%	7.2%	20.8%	7.4%
2016 NREAP trajectory	9.3%	7.1%	11.8%	5.8%
2015/2016 indicative interim trajectory (set by RED)	8.2%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	15.2 - 16%	7 - 7.5%	22.1 - 23.7%	9.1 - 10.2%
2018 NREAP trajectory	12.3%	10.2%	15.7%	7.3%
2017/2018 indicative interim trajectory (set by RED)	10.0%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	16.5 - 16.5%	7.1 - 7.3%	23.4 - 23.5%	11 - 13.3%
2020 NREAP trajectory	14.7%	10.9%	18.9%	10.0%
2020 target (set by RED)	13.0%			

Target achievement: status quo and outlook

- Hungary is projected to have an overall RES share of 16.5% in 2020, which is 3.5 pp higher than its 2020 RED target. The main contribution to the fulfilment of the target is made by the RES-H&C sector, with biomass playing the biggest role.
- In 2016, Hungary had an overall RES share of 14.2%, which was already higher than the 2020 RED target level set by the RED. In 2020, the RES-T share is expected to be 1.0 to 3.3 pp higher than its sectoral NREAP trajectory. In the RES-H&C sector, the sectoral NREAP trajectory 2020 is projected to be surpassed by 4.5 pp to 4.6 pp.

Main policy instruments:

- **RES-E:** In the past, the main support instrument for RES-E in Hungary has been a feed-in-tariff (KÁT). Since January 2017, only installations from 50 to 500 kW are eligible for the feed-in tariff due to the adoption of the new support scheme (METÁR). Installations of 0.5 to 1 MW may apply directly for the premium, while installations larger than 1 MW have to successfully participate in a tender to receive the support. So far, no tenders have been opened. In addition, Hungary introduced a net metering scheme in 2007 which applies to RES-E installations below 50 kW.
- **RES-H&C:** RES-H&C is supported through the Environment and Energy Efficiency Operational Programme (EEEOP). Support is granted via calls for tenders, which have been published continuously between 2014 and 2020.
- **RES-T:** The main support measure for RES-T in Hungary is a biofuel quota set for a period of three to four years. For the period of 2014 to 2018, it requires fuel suppliers to include a biofuel share of 4.9% and a share of 6.4% for 2019 and 2020.

Barriers to RES deployment

Hungary's energy sectors face barriers of several natures. Barriers affecting support schemes are present in all three energy sectors, while administrative processes further complicate the electricity and heating and cooling sectors. The severity of barriers has been slightly increasing over the last six years, which can be partially linked to the country's efforts to develop nuclear power. The government's decision to extend its nuclear-based energy production capacity via two new 1,200 MW-reactors has been considered responsible for the missing political will to grant more support for renewables. This is because the additional nuclear capacity would not be justifiable if a noteworthy amount of renewables was deployed in the country.

Electricity

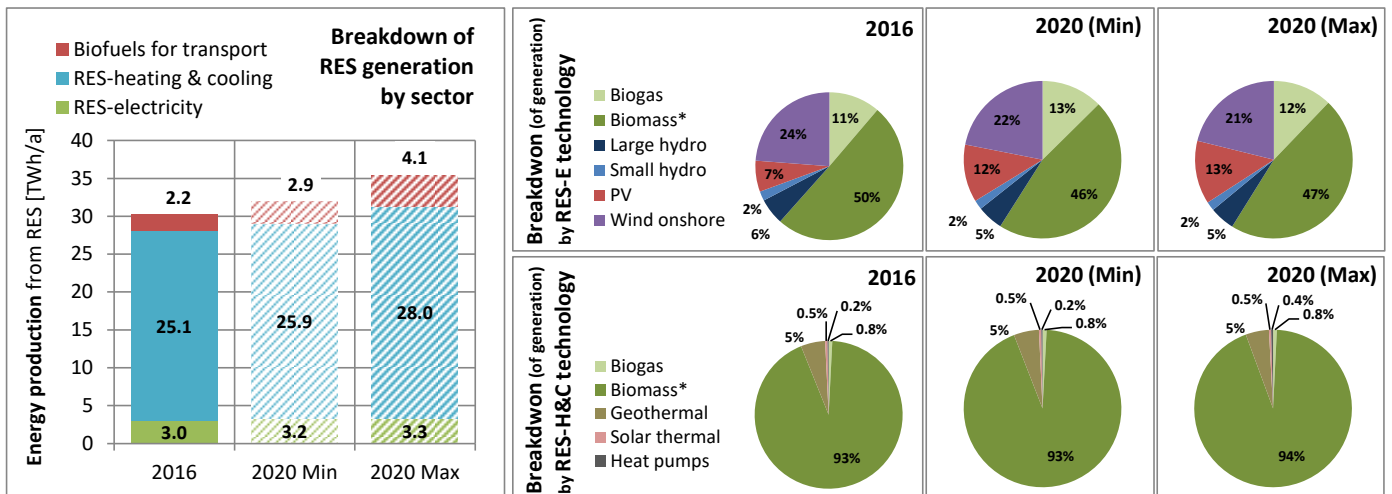
- Planning uncertainty under the new support scheme METAR, in addition to tenders not being announced under this framework. This led to the inhibition of the construction of wind power plants since 2016.
- Too many authorities responsible for the RES licensing process
- Opaque and varying fee system for administrative processes

Heating and Cooling

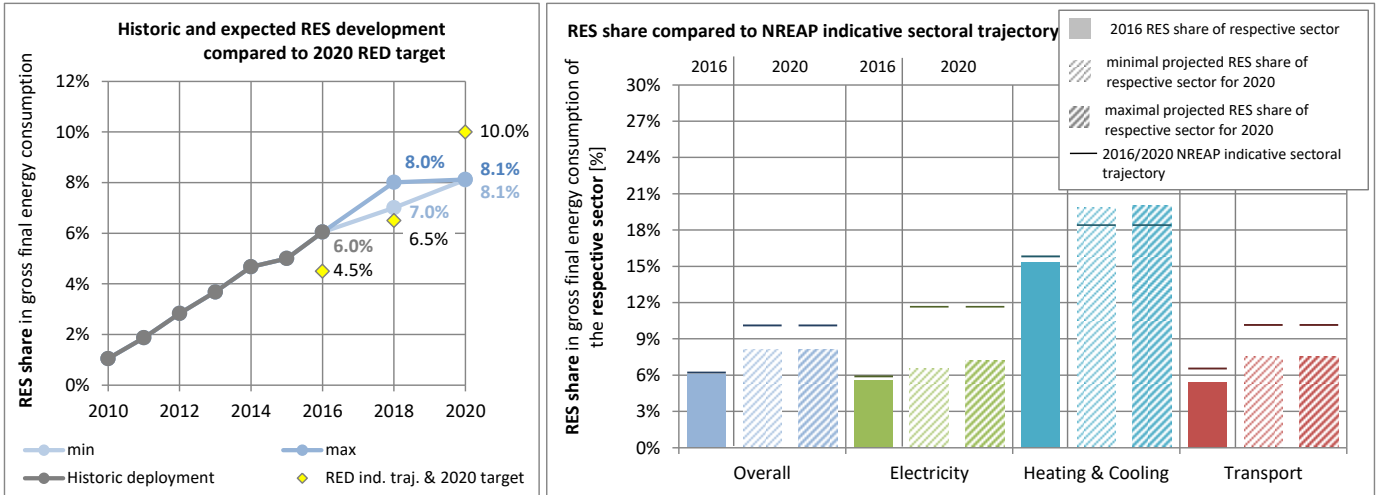
- Time-costly and complex licensing processes
- Insufficient support scheme and unpredictable launch dates

Transport

- Unambitious enforcement of targets
- Missing support strategy for advanced biofuels



Malta



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	6.0%	5.6%	15.3%	5.4%
2016 NREAP trajectory	6.1%	5.8%	15.7%	6.5%
2015/2016 indicative interim trajectory (set by RED)	4.5%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	7 - 8%	6.3 - 6.4%	17.8 - 22.5%	6 - 7.7%
2018 NREAP trajectory	8.3%	9.1%	17.2%	8.5%
2017/2018 indicative interim trajectory (set by RED)	6.5%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	8.1 - 8.1%	6.6 - 7.2%	19.9 - 20%	7.5 - 7.5%
2020 NREAP trajectory	10.0%	11.6%	18.3%	10.1%
2020 target (set by RED)	10.0%			

Target achievement: status quo and outlook

- For Malta, the overall RES share in gross final energy demand 2020 is projected to be 8.1%. That means that the 2020 RED target of 10.0% would not be reached. Hence, Malta should take additional policy measures and consider the use of statistical transfer to reach its 2020 RED target.
- In 2020, the RES-E and RES-T sector are expected to stay below their sectoral NREAP trajectories. However, the RES-H&C sector is projected to surpass its sectoral NREAP trajectory by 1.6 pp to 1.7 pp in 2020. The main contribution to the renewable share in this sector is made by heat pumps and solar thermal energy. In 2016, Malta had an overall RES share of 6.0% in gross final energy demand. That share missed the 2016 NREAP indicative trajectory by 0.1 pp. The RED 2015/2016 indicative trajectory was surpassed.

Main policy instruments:

- RES-E:** Maltese RES-E support is focused on solar energy. Since 2016, technologies other than solar PV are no longer supported. The main support instrument is a feed-in-tariff. In addition, grant schemes support the installation of solar PV in the domestic sector. As of 2018, solar PV installations larger than 1 MWp bid for support in a competitive process.
- RES-H&C:** The deployment of solar water heaters is supported with an investment grant scheme. In addition, a similar grant scheme for heat pumps was introduced in 2017.
- RES-T:** A biofuel quota has been Malta's main policy measure. Introduced in 2011, the biofuel content level is set to gradually increase from 1.5% in 2011 to 10% in 2020. In addition, a grant scheme promotes the uptake of electric vehicles, including Battery Electric Vehicles, Plug-in Hybrids, E-Scooter as well as Pedelecs.

Barriers to RES deployment

The electricity sector in Malta is mainly hampered by building and planning issues related to the lack of space in the country, whereas renewable energy technologies in the heating sector mainly suffer from a lack of long-term security of the support framework. In fact, the support scheme for solar water heaters is always re-launched at the end of the year, as it is linked to the national budget.

Electricity

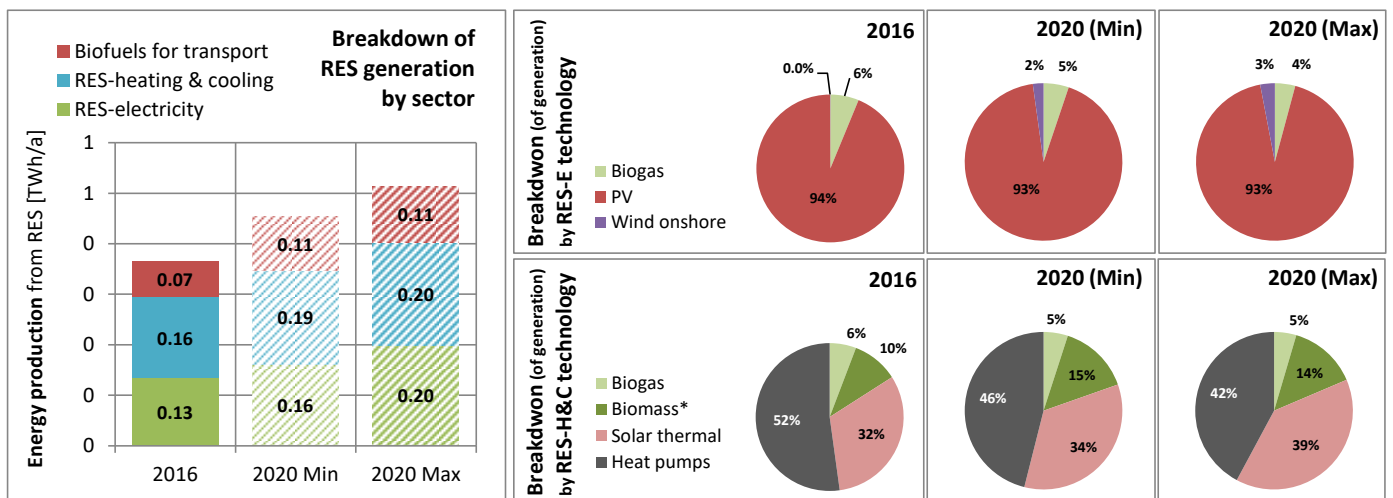
- Planning conflicts due to space limitation
- The high cost of land represents a significant financial burden for large-scale RES installations

Heating and Cooling

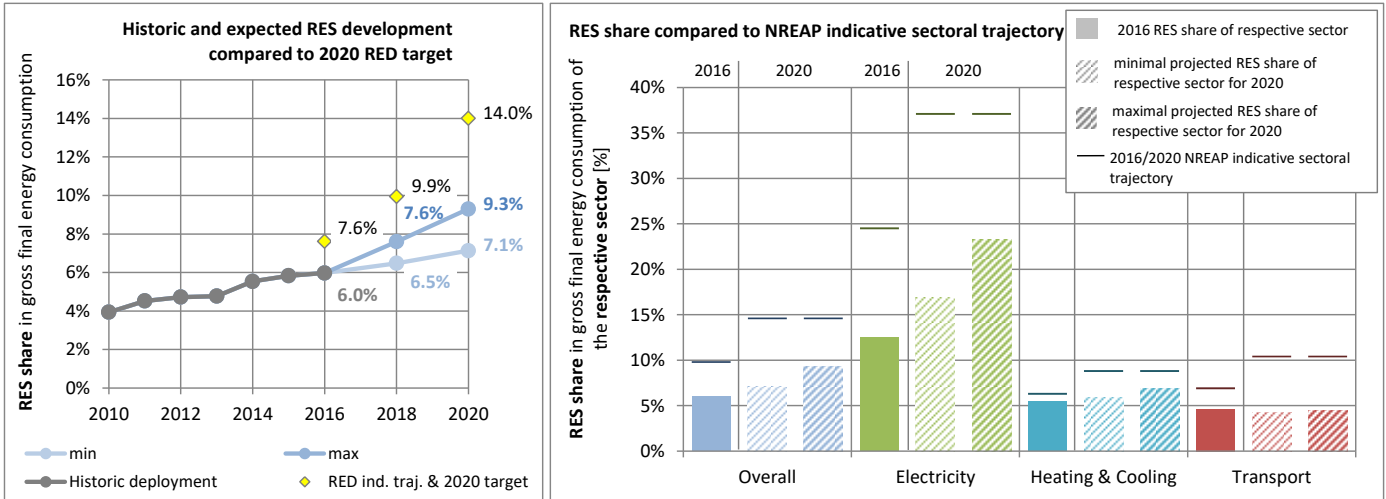
- The subsidies promoting the use of solar water heaters and aerothermal heat pumps are allocated in the beginning of the year on a first come first served basis. The lack of certainty on whether budget will still be there by the time of application creates insecurity amongst applicants.

Transport

- Insufficient enforcement of biofuel quota



Netherlands



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	6.0%	12.5%	5.5%	4.6%
2016 NREAP trajectory	9.7%	24.4%	6.2%	6.8%
2015/2016 indicative interim trajectory (set by RED)	7.6%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	6.5 - 7.6%	15 - 17.5%	5.5 - 6.2%	4.1 - 4.5%
2018 NREAP trajectory	12.1%	30.8%	7.5%	8.5%
2017/2018 indicative interim trajectory (set by RED)	9.9%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	7.1 - 9.3%	16.9 - 23.3%	5.9 - 6.9%	4.3 - 4.5%
2020 NREAP trajectory	14.5%	37.0%	8.7%	10.3%
2020 target (set by RED)	14.0%			

Target achievement: status quo and outlook

- A range of 7.1% to 9.3% RES share in gross final energy consumption 2020 is projected for the Netherlands, which leaves a wide gap towards the 2020 RED target of 14.0%. Making use of cooperation mechanisms seems to be a necessary addition to increasing domestic policy efforts in order to reach the country's 2020 RED target.
- The sectoral NREAP trajectories for RES-E, RES-H&C, and RES-T are missed in all scenarios for 2020. In the RES-E sector, the main contribution is projected to be made by wind energy, with offshore wind gaining importance. In 2016, the Netherlands had an overall RES share of 6.0% in gross final energy demand. This left a significant gap compared to the 2016 NREAP indicative trajectory and the 2015/2016 indicative trajectory.

Main policy instruments:

- RES-E:** The most important policy for RES promotion is the SDE+ (Stimulation of Sustainable Energy Production) under which producers receive a feed-in premium. The SDE+ promotes RES used for electricity, renewable gas and heating purposes (CHP). The energy production based on RES is significantly below the NREAP trajectory. However, since 2015, the available yearly budget for the support of new RES installations under the SDE+ has increased sharply to €12 billion in 2017 and 2018. Consequently, significant volumes of RES-E were auctioned.
- RES-H&C:** The SDE+ covers renewable heat (biomass, geothermal, solar) since 2012. In 2015, the SDE+ was opened for steam production with sustainable biomass (wood pellets) using boilers with a capacity exceeding 10 MW thermal capacity in 2015. From 1st of January 2016, a new subsidy scheme exists for small installations. It aims to promote the heating of homes and offices.
- RES-T:** The use of renewables in transportation is promoted through a biofuel quota and tax credits for biofuel and hydrogen-related investments.

Barriers to RES deployment

The main barrier currently affecting all RES sectors in the Netherlands is the lack of specific deployment targets within the general support strategy. Although the "Energie Akkoord" and the "Energieagenda" sets out short- and long-term plans for the energy transition in the Netherlands, there is industry consensus that the agenda fails to specify clear, short-term goals, as well as specifics on the financing of long-term goals, which would be required to meet the 2020 RES objectives.

Electricity

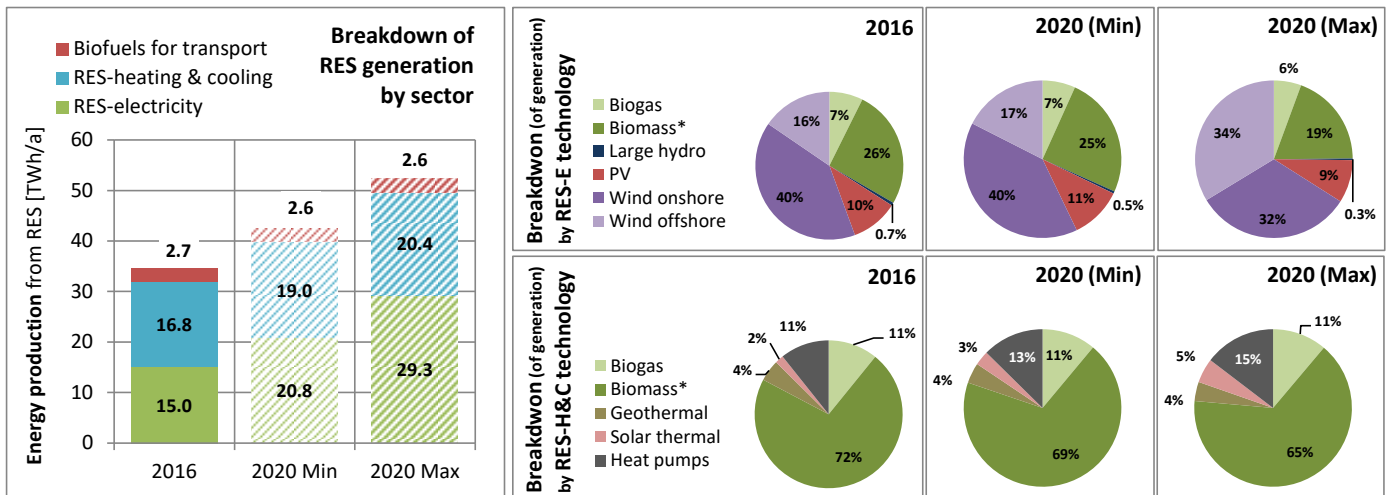
- Overcapacities in neighbouring countries may lead to curtailment of RES plants in the Netherlands
- Shortage of qualified technicians for the installations of RES plants
- Onshore wind interferes with military and civil aviation radars

Heating and Cooling

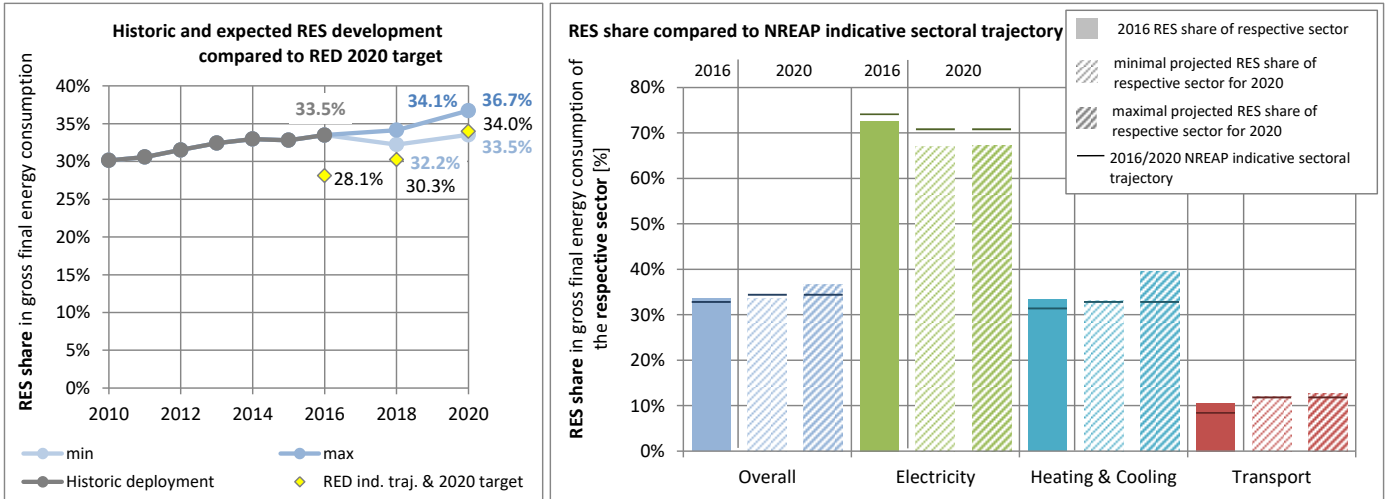
- Insufficient priority given to shallow heat pumps and solar boilers at household level
- Insufficient funding allocated to geothermal and biomass plants
- Shortage of qualified technicians for the installations of RES plants

Transport

- Lack of a holistic vision for the transport sector
- Lawmakers still focus on 1. generation biofuels
- Competencies for the mobility sector are scattered amongst a multitude of ministries and governmental institutions



Austria



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	33.5%	72.6%	33.3%	10.6%
2016 NREAP trajectory	32.6%	73.9%	31.2%	8.2%
2015/2016 indicative interim trajectory (set by RED)	28.1%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	32.2 - 34.1%	66 - 67.3%	32 - 35.8%	10.8 - 11%
2018 NREAP trajectory	33.3%	72.7%	31.8%	9.4%
2017/2018 indicative interim trajectory (set by RED)	30.3%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	33.5 - 36.7%	67 - 67.3%	33.2 - 39.4%	12 - 12.6%
2020 NREAP trajectory	34.2%	70.6%	32.6%	11.6%
2020 target (set by RED)	34.0%			

Target achievement: status quo and outlook

- The projected RES share in gross final energy demand 2020 is in the range of 33.5% to 36.7%, compared to the 34% 2020 RED target. Therefore, Austria is likely to meet its 2020 RED target but may miss it in the most pessimistic case (high demand growth and low additional RES deployment).
- In overall terms, Austria appears well on track of its 2020 RED target. By 2016, a RES share of 33.5% was achieved, which is only half a percentage point below the 2020 RED target level (34%). The indicative sectoral NREAP trajectory for RES-E is projected to be missed by 3.3 pp to 3.6 pp in 2020, while the RES-H&C NREAP trajectory is surpassed by 0.6 pp to 6.8 pp. In the RES-E sector, large hydro power accounts for the majority of the generation, whereas in the RES-H&C sector, biomass plays the most important role in 2020.

Main policy instruments:

- RES-E:** Austria's main RES-E support measure, the Green Electricity Act (Ökostromgesetz 2012, ÖSG 2012), provides technology-specific feed-in-tariffs for solar PV, biomass, wind and hydro power. In addition, Austria provides investment grants for rooftop solar PV systems and home storage.
- RES-H&C:** The environmental support scheme (Umweltförderungen) provides investment grants to, e.g., district heating based on renewables, solar thermal energy, heat pumps and building renovations. Several additional measures are implemented on provincial level by the federal states
- RES-T:** Austria's main RES-T policy is a biofuel quota. It obliges fuel suppliers to annually substitute 5.75% of fossil fuels with biofuels. In addition, several measures to support the uptake of electric mobility have been implemented.

Barriers to RES deployment

In all three sectors, there are barriers with regard to support schemes, which is more pronounced in the electricity sector compared to others. Various amendments in the renewable energy legislation have not led to an easing of the situation. Administrative issues have worsened in the electricity and heating sectors due to more complicated and time-consuming application processes. Also, the lack of harmonisation across the different regions comes into play here.

Electricity

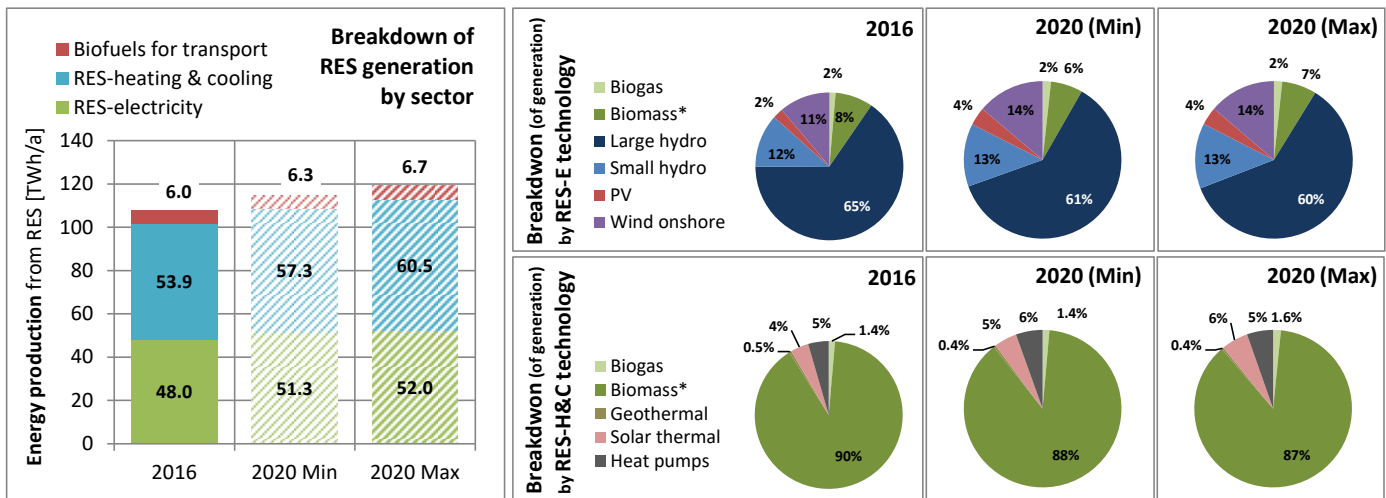
- Uncertainty regarding the reform of the Green Electricity Act
- The current support for RES technologies is considered insufficient for the profitability of projects
- Feed-in tariff period of 13 years for wind power plants is considered insufficient by plant operators

Heating and Cooling

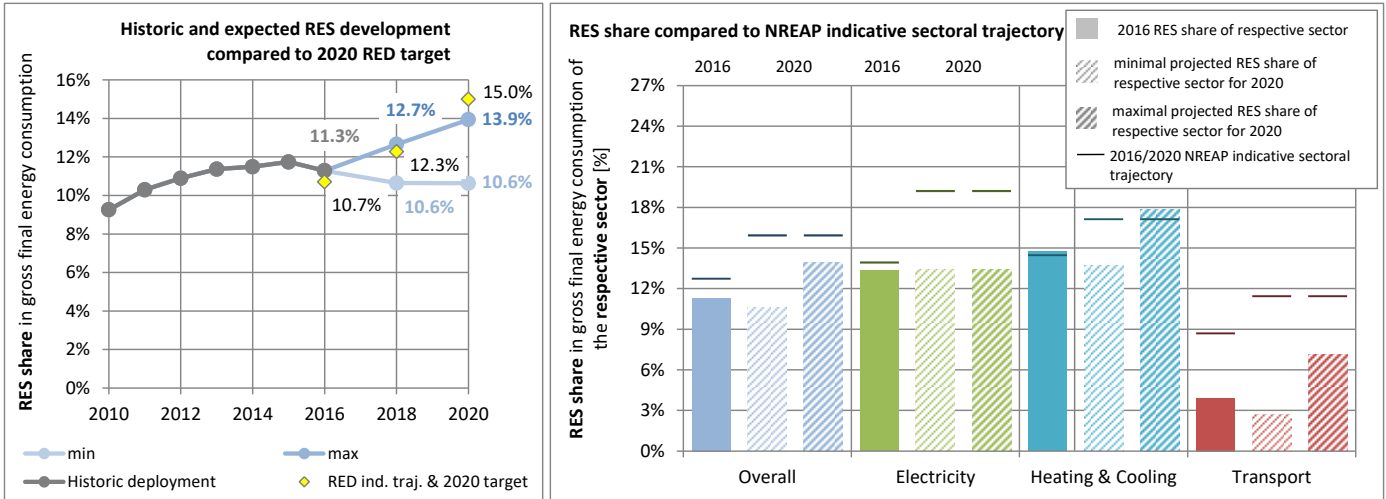
- Insufficient stimulation of the switch from oil-fired boilers to renewable solutions
- Poor support for the feed-in of biomethane into the national gas grid

Transport

- Degradation of the mixing quota from E10 to E5
- Lack of action for the EV rollout at municipal level



Poland



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	11.3%	13.4%	14.7%	3.9%
2016 NREAP trajectory	12.7%	13.9%	14.4%	8.6%
2015/2016 indicative interim trajectory (set by RED)	10.7%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	10.6 - 12.7%	13.1 - 13.4%	13.7 - 16.4%	2.8 - 5.1%
2018 NREAP trajectory	14.1%	15.6%	15.7%	10.1%
2017/2018 indicative interim trajectory (set by RED)	12.3%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	10.6 - 13.9%	13.4 - 13.4%	13.7 - 17.9%	2.7 - 7.1%
2020 NREAP trajectory	15.9%	19.1%	17.1%	11.4%
2020 target (set by RED)	15.0%			

Target achievement: status quo and outlook

- The projections indicate an overall RES share in the range of 10.6% to 13.9% in 2020, which is below the country's 2020 RED target level of 15.0%. Hence, Poland should take additional policy measures and consider the use of statistical transfer to reach its 2020 RED target.
- The RES-E sectoral NREAP trajectory is projected to be missed by 5.7 pp in 2020. For the RES-H&C sector it is possible to reach the sectoral NREAP trajectory in the best case. Biomass technology represents the majority of this share. Poland had an overall RES share of 11.3% in gross final energy consumption in 2016, which was below its 2016 NREAP indicative trajectory of 12.7%. The 2015/2016 RED indicative trajectory of 10.7% was surpassed.

Main policy instruments:

- RES-E:** In 2016, Poland introduced technology neutral auctions as the main mechanism in pursuit of the 2020 target. However, before November 2018 only two tenders were held in the previous two years (generating only 0.2-0.3 TWh annually). In November 2018, a number of tenders were conducted, but much of the budget remained unassigned, and a few tenders closed unresolved due to too few bidders. At the same time, the old quota scheme is being phased out.
- RES-H&C:** Poland has capex support programs (subsidies and loans) in place. The main subsidy & loan program, Prosumer (EUR 200 m for 2014-2022), supports heat installations for biomass, heat pumps and solar thermal collectors up to 300 kWt. In addition, since 2017, heat-trading entities are obliged to purchase heat from renewable energy sources if it is offered at a price no higher than the average price of heat from other sources.
- RES-T:** The main RES-T instrument is a quota system for biofuels. The quota was lowered for 2017 (to 7.10%, down from 7.80%). The level is set to rise to 8.5% by 2020.

Barriers to RES deployment

The development of RES in the Polish electricity sector faces barriers regarding support scheme, grid, administrative, building and planning and information issues, with a constant severity over the analysed six years. Large hydro power is the most significant RES technology for the achievement of the planned 2020 targets, followed by small hydro power and onshore wind. The heating and cooling sector faces barriers with regard to support scheme issues. The key RES-H&C technology is solid biomass. In the transport sector, the main barriers are also related to support scheme issues. The key technologies in RES-T are biodiesel and bioethanol for the 2020 targets.

Electricity

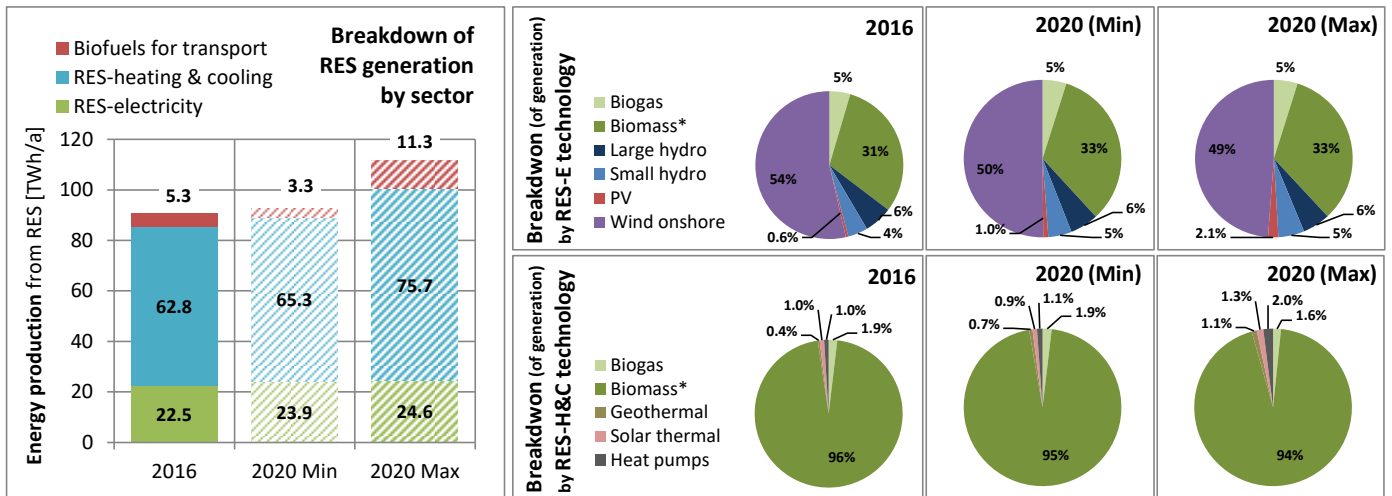
- Uncertainty regarding the past and existing support scheme
- Existence of building restrictions that make wind onshore installations largely impossible

Heating and Cooling

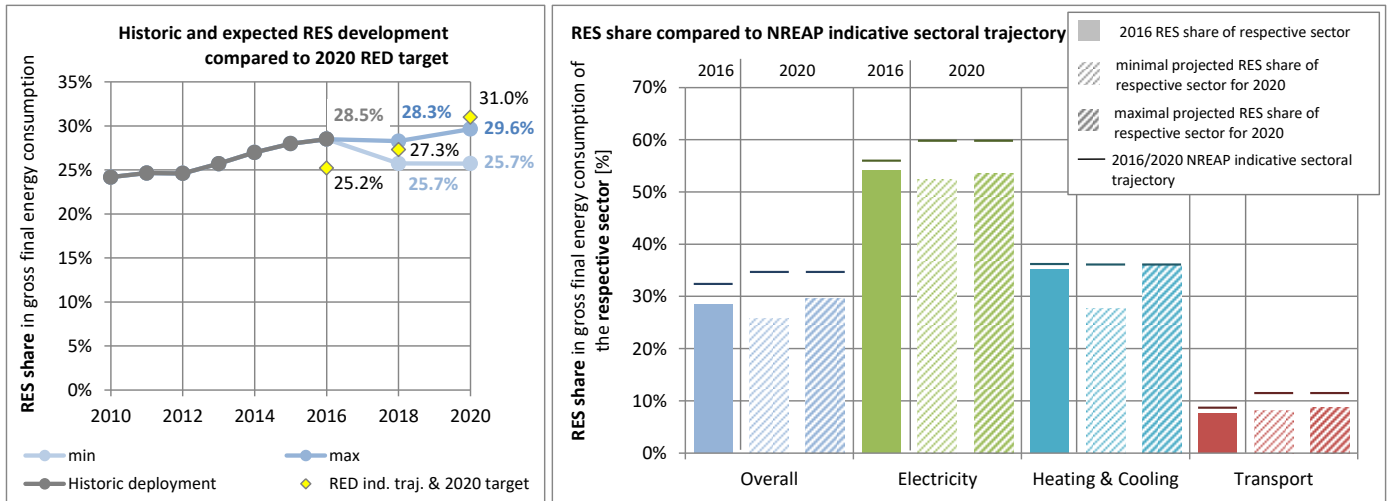
- Lack of a common vision and targets for the H&C sector
- Lack of an effective support scheme

Transport

- Lack of a consistent vision for RES-T. The strong commitment for the development of e-mobility is not accompanied by an increase in the production of RES-E



Portugal



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	28.5%	54.1%	35.1%	7.5%
2016 NREAP trajectory	32.2%	55.8%	36.0%	8.5%
2015/2016 indicative interim trajectory (set by RED)	25.2%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	25.7 - 28.3%	52.3 - 52.4%	28.4 - 34.1%	7.7 - 8.1%
2018 NREAP trajectory	34.0%	59.5%	35.8%	10.1%
2017/2018 indicative interim trajectory (set by RED)	27.3%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	25.7 - 29.6%	52.3 - 53.5%	27.6 - 36.2%	8.2 - 8.7%
2020 NREAP trajectory	34.5%	59.6%	35.9%	11.3%
2020 target (set by RED)	31.0%			

Target achievement: status quo and outlook

- For the year 2020, an overall RES share in the range of 25.7% and 29.6% in gross final energy consumption is projected for Portugal. This is below the country's 2020 RED target of 31.0%. Hence, Portugal should take additional policy measures and consider the use of statistical transfer to reach its 2020 RED target.
- While the RES-E and RES-T sectors are projected to stay below the 2020 NREAP sectoral trajectory, the RES-H sector appears more or less on track of the sectoral NREAP trajectory. Biomass accounts for more than 90% of the RES share in this sector. In 2016, Portugal had an overall RES share of 28.5% in gross final energy consumption. That was above the 2015/2016 RED indicative trajectory but below the country's NREAP indicative trajectory of 32.2%.

Main policy instruments:

- RES-E:** Portugal has revoked the feed-in tariff scheme for new installations in 2012. Since then, no support has been available for new large-scale installations. In 2015, a new scheme was introduced to stimulate small production units (up to 250 kW) and self-consumption units (up to 1 MW). Under this scheme, successful bidders receive a feed-in tariff. The scheme has an annual cap of 20 MW and is thus very limited in scope. For 2019, new frameworks for Solar PV auctions and Wind Repowering are foreseen to trigger new investments.
- RES-H&C:** No direct support schemes for RES-H&C are currently in place. The Energy Efficiency Fund (FEE) provided a subsidy to investments in solar thermal installations for heating water and a round for calls ran for half a year in 2016. No additional calls for 2017 or 2018 had been put forward.
- RES-T:** Two schemes promote the use of renewable energy sources in the transport sector: First, a biofuel quota for companies supplying fuels for consumption that is set at 10% for 2019 and 2020. Second, a tax exemption to small producers of biofuels (PPDs). PPDs are exempt from the Petrol Product Tax up to a volume of 40,000 t/year.

Barriers to RES deployment

The development of the Portuguese renewable electricity sector faces important barriers related to burdensome administrative procedures and lack of visibility on new support schemes. Grid issues concerning low interconnection levels are being addressed through the signing of an agreement on interconnection expansion between Portugal, Spain and France. In the heating sector, the central barrier is the absence of an effective RES-H&C strategy. There is a lack of support instruments and the information on RES-H&C technologies and its benefits is not sufficiently disseminated amongst policymakers, the general public, urban planners and installers. In the transport sector, the main barriers are related to building and planning issues. Biodiesel, electricity and other biofuels are the dominant RES technologies for the achievement of the planned 2020 targets in the Portuguese transport sector.

Electricity

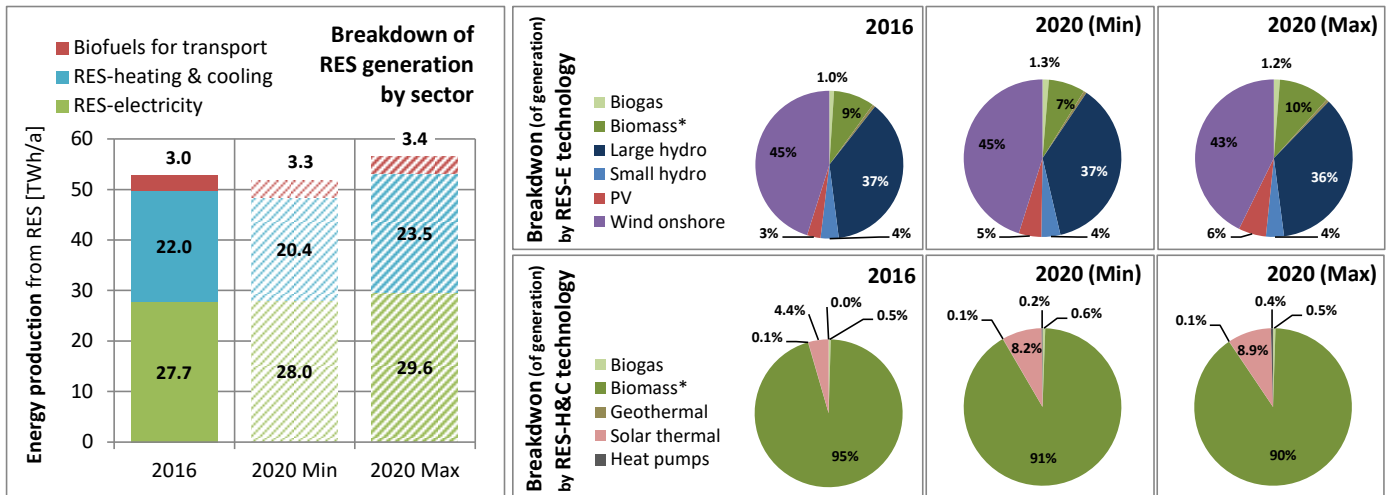
- Uncertainty about the new support mechanism
- Complex administrative procedures due to several involved authorities

Heating and Cooling

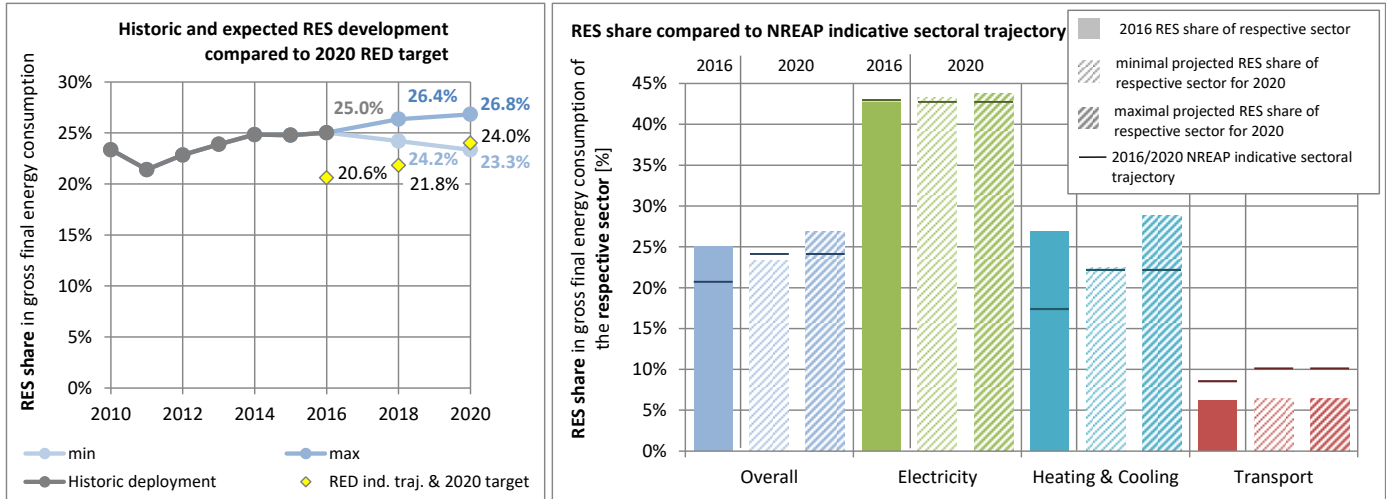
- Lack of effective RES-HC strategy and support instrument
- Lack of awareness about RES-HC technologies and its benefits

Transport

- Lack of incentives in terms of agriculture policy and land planning for second generation biofuels
- Pricing of biodiesel does not ensure the profitability of the biodiesel production industry



Romania



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	25.0%	42.7%	26.9%	6.2%
2016 NREAP trajectory	20.6%	42.8%	17.3%	8.4%
2015/2016 indicative interim trajectory (set by RED)	20.6%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	24.2 - 26.4%	44.4 - 44.6%	23.5 - 27.6%	6.5 - 6.9%
2018 NREAP trajectory	21.8%	42.6%	18.9%	9.2%
2017/2018 indicative interim trajectory (set by RED)	21.8%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	23.3 - 26.8%	43.3 - 43.7%	22.5 - 28.8%	6.4 - 6.4%
2020 NREAP trajectory	24.0%	42.6%	22.1%	10.0%
2020 target (set by RED)	24.0%			

Target achievement: status quo and outlook

- The projected RES deployment and gross final energy demand for 2020 result in a RES share in the range of 23.3% to 26.8% compared to a 24% RED target in 2020. Thus, Romania seems to be well on track to reaching its 2020 RED target.
- The projections for 2020 show that the RES-H&C NREAP trajectory of 22.1% will be met with a share in this sector of 22.5% to 28.8%. The 42.6% RES-E NREAP trajectory is projected to be surpassed by 0.7 to 1.1 pp. In 2016, the overall RES share was 25.0%, thereby meeting the 2016 NREAP indicative trajectory as well as the 2015/2016 RED indicative trajectory.

Main policy instruments:

- RES-E:** The main RES-E support scheme is a green certificate quota system that covers onshore wind, solar PV, geothermal, biogas, biomass and hydropower projects. Important amendments were introduced in 2017 to improve the trade of green certificates. Furthermore, in 2017, a scheme was introduced to encourage investment in high-efficiency co-generation ("New Support Scheme") and energy production based on biomass, biogas and geothermal resources. Furthermore, recent amendments to the renewable energy law will enable prosumers to sell the excess electricity to the grid (net-metering).
- RES-H&C:** The main measure supporting RES-H&C is the Green Home Programme (applying to both natural and legal persons). After a halt in calls for applications in 2011, a new call was opened at the end of 2016. In 2016, a new programme called Green Home Plus financing insulation measures was introduced. Moreover, the incentives for investments in high-efficiency co-generation under the "New Support Scheme" also support the use of RES in H&C.
- RES-T:** Blending mandates for biodiesel reached 6.5% in 2016. Starting from 1 January 2019, the blending mandate for bioethanol is increased from 4.5% to 8% (Emergency Ordinance 80/2018). In addition, the National Car Fleet Renewal Incentive Programme provides financial support for the purchase of electric vehicles.

Barriers to RES deployment

Support scheme issues are severely affecting all three energy sectors in Romania. In addition, the very burdensome and lengthy administrative procedure is seriously limiting the development of RES-E technologies. For heating and cooling, the given support is considered as too low. Moreover, the poorly maintained district heating infrastructure is seriously affecting the RES-H&C technology development.

Electricity

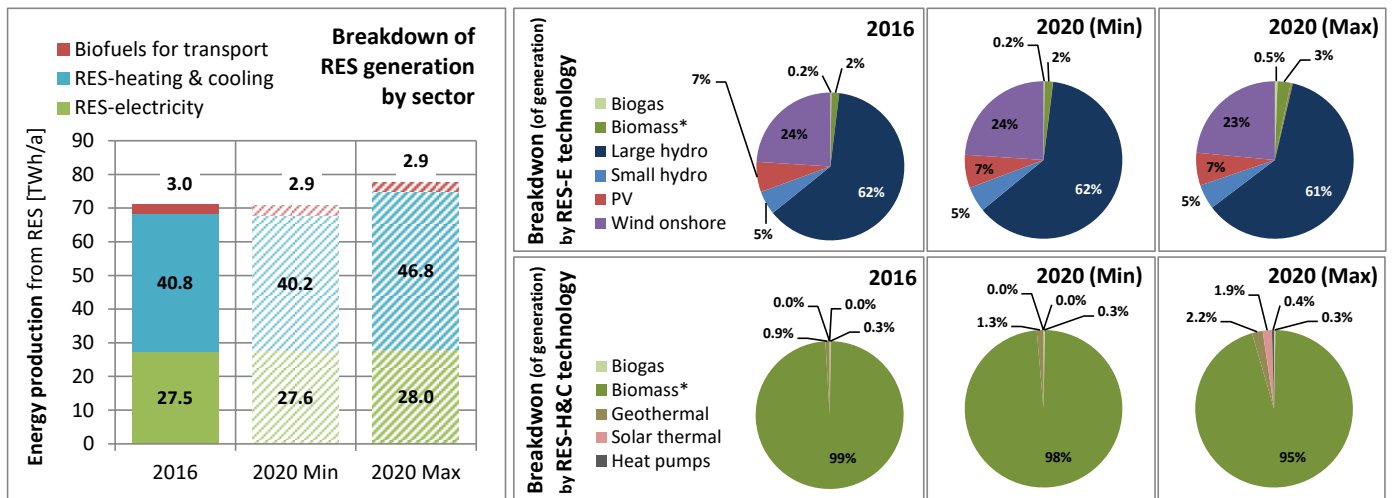
- Decrease of average green certificate prices due to an oversaturated market
- Suspension of the support scheme for large-scale installations
- Frequent amendments to the Renewable Energy Law
- Long administrative procedures result in high development costs

Heating and Cooling

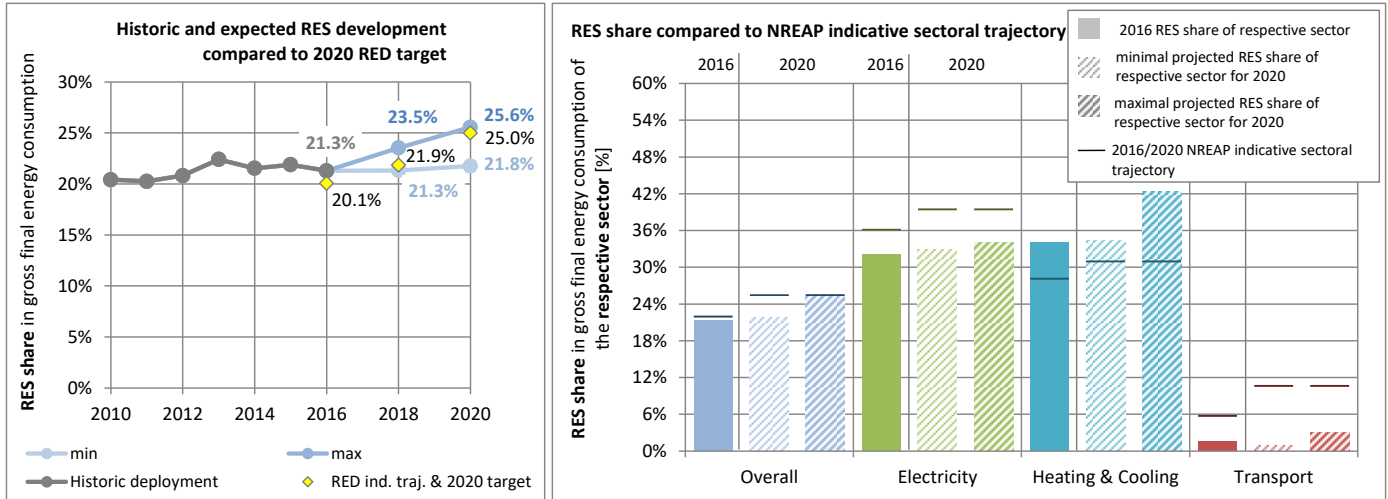
- Lack of funding for subsidy programs promoting RES-H&C projects
- Poorly maintained district heating network

Transport

- Lack of financial incentives for fuel retailers to purchase biofuels



Slovenia



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	21.3%	32.1%	34.0%	1.6%
2016 NREAP trajectory	21.8%	36.0%	28.0%	5.6%
2015/2016 indicative interim trajectory (set by RED)	20.1%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	21.3 - 23.5%	32.6 - 33.1%	32.7 - 38.5%	1.4 - 1.7%
2018 NREAP trajectory	23.6%	38.1%	29.4%	7.7%
2017/2018 indicative interim trajectory (set by RED)	21.9%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	21.8 - 25.6%	32.9 - 34%	34.3 - 42.4%	0.9 - 3%
2020 NREAP trajectory	25.3%	39.3%	30.8%	10.5%
2020 target (set by RED)	25.0%			

Target achievement: status quo and outlook

- In Slovenia, the projected RES deployment and gross final energy demand 2020 result in a RES share in the range of 21.8% to 25.6%, compared to a 25% 2020 RED target. The 2020 RED target will only be met with a steady deployment of RES technologies while maintaining the same level of energy consumption for the coming years.
- The projections for 2020 show that just the RES-H&C NREAP trajectory of 30.8% will be met with a share in this sector of 34.3% to 42.4%. The 39.3% RES-E NREAP trajectory is expected to be missed by 6.4 pp to 5.3 pp in 2020. In 2016, Slovenia's overall RES share was 21.3%. That share missed the 2016 NREAP indicative trajectory by 0.5 pp. The 2015/2016 RED indicative trajectory was still surpassed.

Main policy instruments:

- RES-E:** In 2014, a tendering scheme replaced the former feed-in tariff/premium scheme for installations above 500 kW. Installations up to 500 kW are free to choose between a feed-in tariff and a premium. Eligible technologies for both schemes are wind, solar and geothermal energy, hydro power, biomass and biogas plants. The new scheme came into effect in October 2016. No auctions were held between March 2014 and October 2016. In 2017 and 2018, yearly budgets of € 10 million were provided for the tendering scheme. In addition to the tendering scheme, low-interest loans are provided to renewable energy projects.
- RES-H&C:** Slovenia provides support to RES-H&C in the form of low interest loans, as well as investment grants. Two public tenders were published in 2015 and one in 2016. In those tenders, support was allocated for the installation of solar heating systems, wood biomass combustion installations and heat pumps, both for central heating.
- RES-T:** Slovenia has a biofuel obligation. For 2018, the mandatory biofuel share is set at 7.4% and shall reach 10% in 2020. In addition, biofuels are exempt from excise taxes.

Barriers to RES deployment

The main barriers in all three energy sectors in Slovenia are related to the support schemes. Additionally, the electricity sector faces some minor barriers in the administrative processes, and building and planning issues.

Electricity

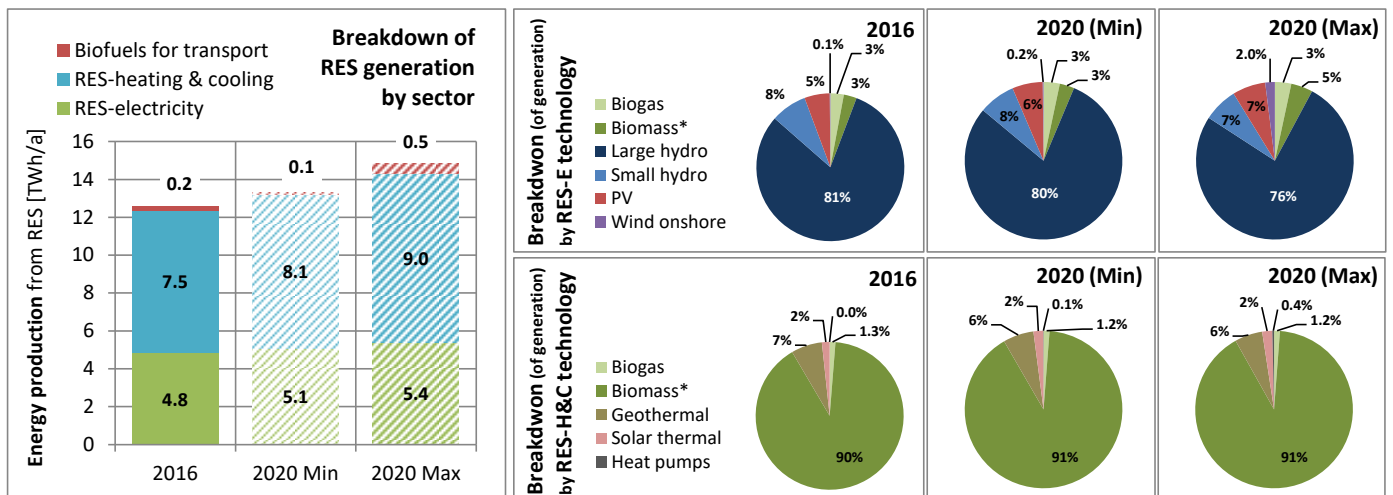
- Lack of mid- and long-term RES targets
- Unstable support framework

Heating and Cooling

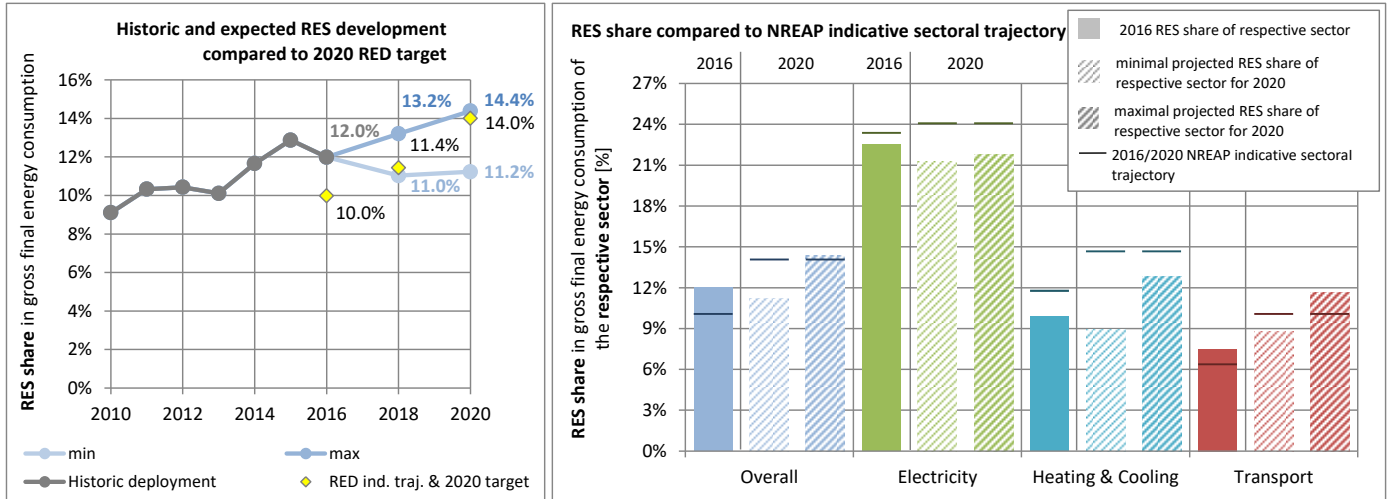
- Lack of concrete measures in the Energy Concept for Slovenia 2050

Transport

- Lack of public discourse and long-term strategy for RES-T



Slovakia



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	12.0%	22.5%	9.9%	7.5%
2016 NREAP trajectory	10.0%	23.3%	11.7%	6.3%
2015/2016 indicative interim trajectory (set by RED)	10.0%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	11 - 13.2%	21.9 - 22.2%	8.7 - 11.2%	7.7 - 9.6%
2018 NREAP trajectory	11.4%	23.7%	13.3%	8.3%
2017/2018 indicative interim trajectory (set by RED)	11.4%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	11.2 - 14.4%	21.3 - 21.8%	8.9 - 12.8%	8.8 - 11.6%
2020 NREAP trajectory	14.0%	24.0%	14.6%	10.0%
2020 target (set by RED)	14.0%			

Target achievement: status quo and outlook

- The projected RES deployment and gross final energy demand 2020 result in a RES share in the range of 11.2% to 14.4% compared to a 14.0% 2020 RED target. Only in the best-case scenario can Slovakia reach its target with domestic measures.
- The projections for 2020 show that – similar to 2016 – the sectoral NREAP trajectories for RES-E and RES-H&C are missed in 2020, but the overall RES target is still achievable. The 2020 NREAP sectoral trajectory for RES-E is expected to be missed by 2.2 pp to 2.7, and the RES-H&C NREAP trajectory by 1.8 pp to 5.7 pp. In 2016, the overall RES share in gross final energy demand accounted for 12.0%, surpassing the 2016 NREAP indicative trajectory, as well as the 2015/2016 RED indicative trajectory.

Main policy instruments:

- **RES-E:** The main support scheme is a feed-in tariff scheme introduced in 2010. However, in 2013, DSOs announced a connection moratorium with the result that new RES installations are not connected to the grid. Gridlock is expected to be overcome by an upcoming major reform of the RES Act coming into force by 1 January 2019. The RES act introduces a feed-in premium scheme (auction system) for installations exceeding 500 kW and promotes self-consumption for installations up to and including 500 kW
- **RES-H&C:** In 2016, programmes were introduced that provide financial support for heating technologies capable of self-consumption, for the renovation of heat distribution pipes, as well as for RES in heating and cooling in public buildings.
- **RES-T:** Slovakia's main support instrument is a biofuel quota with levels set at 5.8% in 2018 and 7.6% in 2020. New policy instruments promoting alternative propulsion vehicles should be based on the Action Plan on Electromobility Development in the Slovak Republic, which was still in the legislative process in late December 2018.

Barriers to RES deployment

Important barriers resulting from support scheme and grid issues hinder the development of the Slovak electricity sector. Information as well as building and planning issues impede RES-E deployment only to a minor degree. In the heating sector, serious barriers regarding support schemes can be noted, as well as moderate barriers dealing with administrative issues. In the transport sector, the main barrier is related to the support schemes.

Electricity

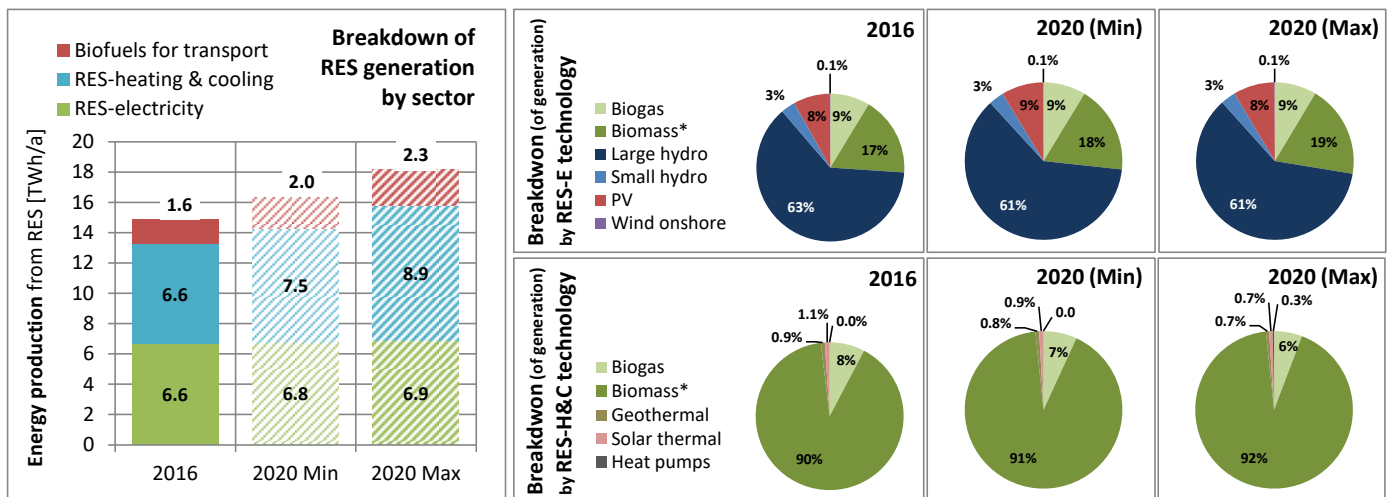
- A connection moratorium, announced in 2013, hinders connection of new installations to the grid. However, this barrier should be overcome in 2019 (see previous section).
- Instability of investment environment due to frequent legislative changes
- Application of a controversial grid fee for the access and connection to the distribution grid (so-called 'G-Component'). After being declared unconstitutional by the Slovak Constitutional Court, the 'G-Component' will be in accordance with the law from 1 January 2019 through amendment No. 309/2018 Coll.
- Lack of certification scheme for wind plant installers and requirement of a full environmental impact assessment even in case of small-scale wind installations

Heating and Cooling

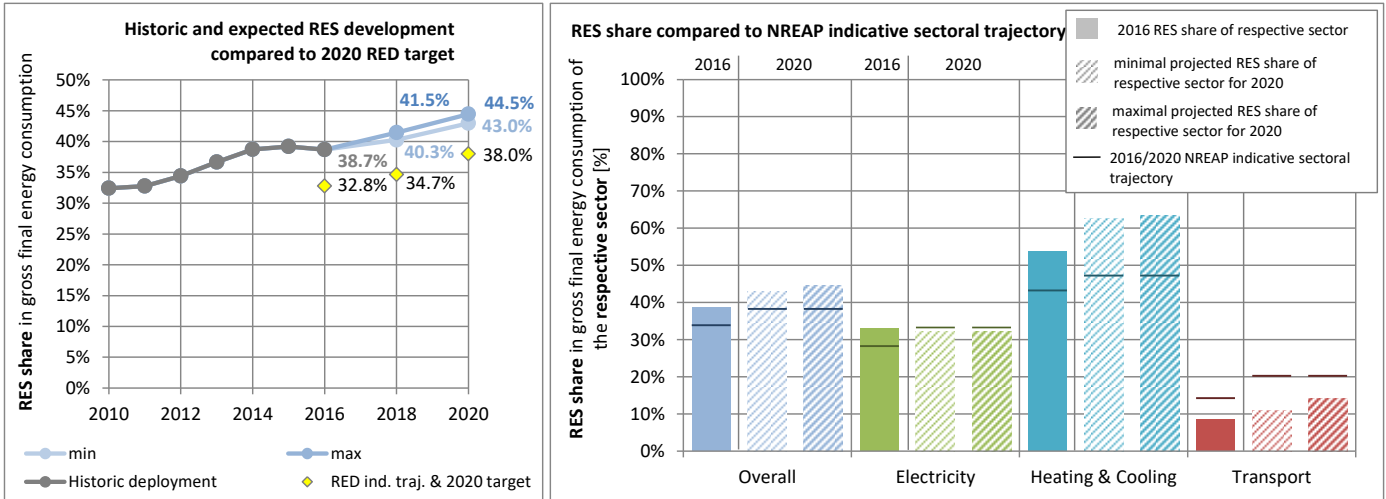
- Low support for H&C installations and limited funds for CHP plants
- Lack of political will to further develop RES-H&C

Transport

- Lack of clarity and stringency in administrative guidelines and legal documents



Finland



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	38.7%	32.9%	53.7%	8.4%
2016 NREAP trajectory	33.6%	28.0%	43.0%	14.0%
2015/2016 indicative interim trajectory (set by RED)	32.8%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	40.3 - 41.5%	31.3 - 31.9%	58.2 - 58.8%	9.1 - 11%
2018 NREAP trajectory	35.7%	30.0%	45.0%	17.0%
2017/2018 indicative interim trajectory (set by RED)	34.7%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	43 - 44.5%	32.1 - 32.1%	62.5 - 63.5%	10.9 - 14.2%
2020 NREAP trajectory	38.0%	33.0%	47.0%	20.0%
2020 target (set by RED)	38.0%			

Target achievement: status quo and outlook

- Finland's overall RES share in gross final energy consumption is projected to be between 43.0% and 44.5% in 2020 and thus the country is expected to overachieve its 2020 RED target of 38.0%. The main additional RES deployment between 2016 and 2020 is expected to be seen in the RES-H&C sector, which also contributes most to the overall target achievement. The expected RES-E share in 2020 is slightly lower than the RES-E share in 2016. This is the result of an expected increase in gross electricity demand while no additional net deployment of RES-E technologies is anticipated.
- Finland had an overall RES share of 38.7% in 2016 which was already above the 2020 RED target level of 38.0% set by the RES directive.

Main policy instruments:

- RES-E:** Finland maintains a feed-in premium scheme for wind, biomass and biogas under its Production Aid Act. Technology-specific volume caps exist. In 2015, the Government excluded wind power from the scheme because of plummeting power prices leading to higher subsidies. A forthcoming new support scheme will be based on tenders for sliding and fixed premiums, this support will be technology neutral. In addition, capital investment subsidies for RES are provided to biomass in electricity and heat generation.
- RES-H&C:** Finland maintains a "heat bonus" for CHP plants operating on biogas and wood fuel with a minimum efficiency of 50% and 70% if the capacity exceeds 1 MW. Moreover, Finland applies a tax to the fuel based on the energy and carbon content. The tax rate for heating fuels was increased for the first time in 2012, and subsequently in 2014, 2015 and 2016.
- RES-T:** The main support scheme is a quota system, which obliges fuel suppliers to blend a 20% biofuel share in the company's total fuel sales by 2020. Biofuels are also supported through tax incentives based on energy content and carbon dioxide emissions.

Barriers to RES deployment

The development of RES in the electricity sector is mainly hindered by the insufficient support scheme, whereas the heating and transport sectors deal more predominantly with weak infrastructures hampering the deployment of RES.

Electricity

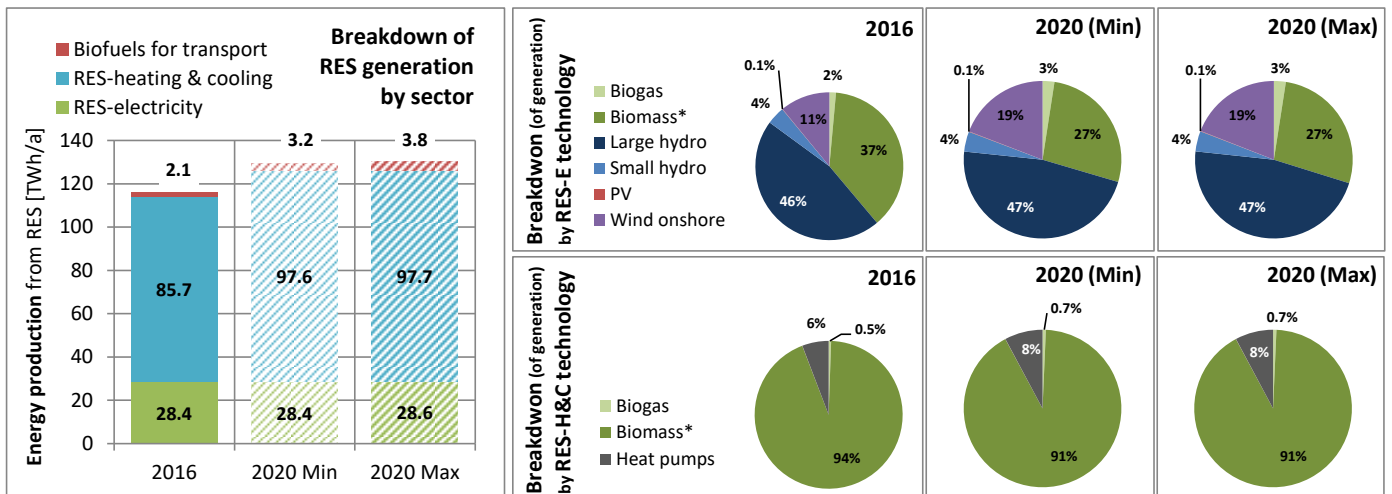
- Limited scope of price premium support scheme for small-scale installations
- Overloaded electricity grids require costly reinforcement
- Lengthy assessment procedures of Finnish Air Forces related to radar systems security increases project costs

Heating and Cooling

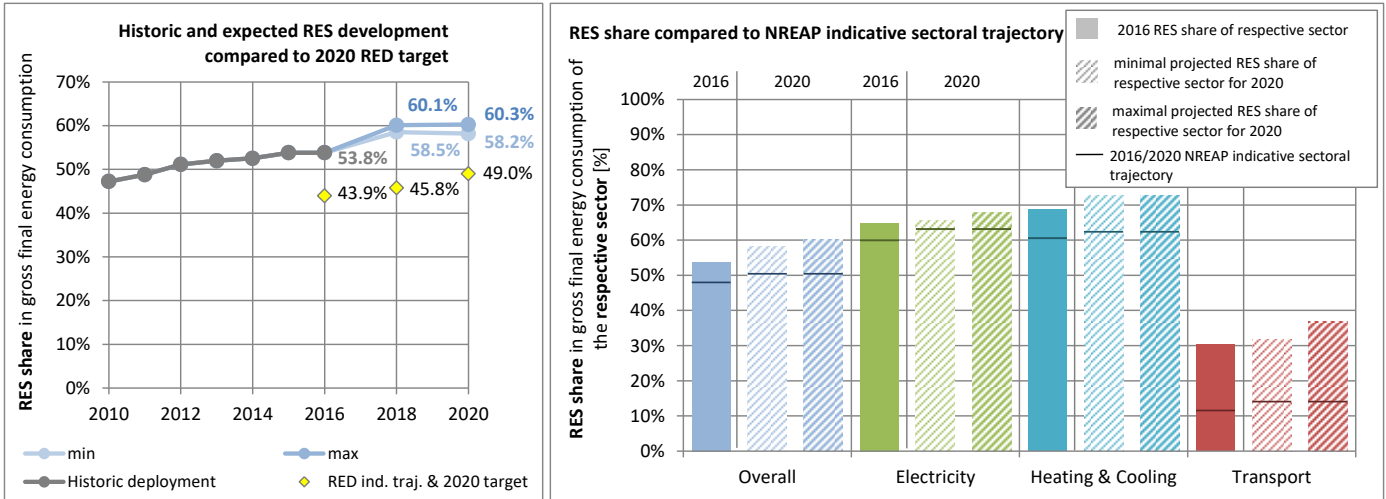
- Available support programmes for RES-H&C installations in private households are insufficiently funded
- Lack of regulation impedes the access to the heating network for RES-HC producers
- Lack of harmonised procedures for building permits amongst municipalities and other local authorities

Transport

- Lack of an appropriate infrastructure for e-mobility as well as for biodiesel and biogas
- Farmers deem the upfront investment in RES plants as too risky



Sweden



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	53.8%	64.9%	68.6%	30.3%
2016 NREAP trajectory	47.7%	59.7%	60.3%	11.3%
2015/2016 indicative interim trajectory (set by RED)	43.9%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	58.5 - 60.1%	64.8 - 66.7%	74.8 - 79.9%	29.8 - 34.8%
2018 NREAP trajectory	49.0%	61.3%	61.2%	12.5%
2017/2018 indicative interim trajectory (set by RED)	45.8%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	58.2 - 60.3%	65.7 - 68%	72.7 - 72.7%	31.8 - 37%
2020 NREAP trajectory	50.2%	62.9%	62.1%	13.8%
2020 target (set by RED)	49.0%			

Target achievement: status quo and outlook

- The projected RES deployment and gross final energy demand for 2020 result in a RES share of 58.2 % to 60.3%, compared to a 49% 2020 RED target. The main contribution to the RES-E share is made by large hydro power, with onshore wind gaining importance until 2020. In the RES-H&C sector, biomass plays the most important role and is complemented by heat pumps.
- In 2016, Sweden met all sectoral NREAP indicative trajectories. The RES-E indicative trajectory was surpassed by 5.2 pp, the RES-H&C trajectory by 8.3 pp and the RES-T trajectory by 19 pp. The country surpassed the 2016 NREAP indicative trajectory, as well as the 2015/2016 RED indicative trajectory.

Main policy instruments:

- RES-E:** The Electricity Certificate System is the main policy instrument. It consists of quota obligations for electricity suppliers in combination with a common electricity certificate market with Norway. In addition, Sweden grants tax reductions to wind energy, micro-scale solar and geothermal energy, hydro power and biomass. Sweden also provides investment grants for solar PV of up to 30% of investment costs.
- RES-H&C:** Heat pumps, solar-thermal energy, biogas and biomass receive exemptions from the energy, carbon and the nitrous oxide tax. Income tax reductions for RES-H&C works on households are granted and biogas projects receive support via investment grants.
- RES-T:** Biofuels receive deductions on energy and carbon dioxide taxes, ranging from 63% to 100% (energy tax), depending on the type of biofuel, and 100% (carbon dioxide tax). Since 2012, Sweden promotes electric vehicles through investment grants with very low GHG emissions (<50 gCO₂/km). Similar grants for electric buses exist since 2016. Moreover, in 2018 Sweden introduced the obligation for fuel suppliers to reduce GHG emissions from gasoline and diesel by 40% in 2030.

Barriers to RES deployment

Overall, the most important barriers hindering the deployment of renewable energies in the electricity, heating and transport sectors deal with support scheme issues. In addition, lacking grid capacities play a major role in the electricity sector, whereas the use of RES technologies in the heating and transport sector is hindered by a general lack of awareness and knowledge.

Electricity

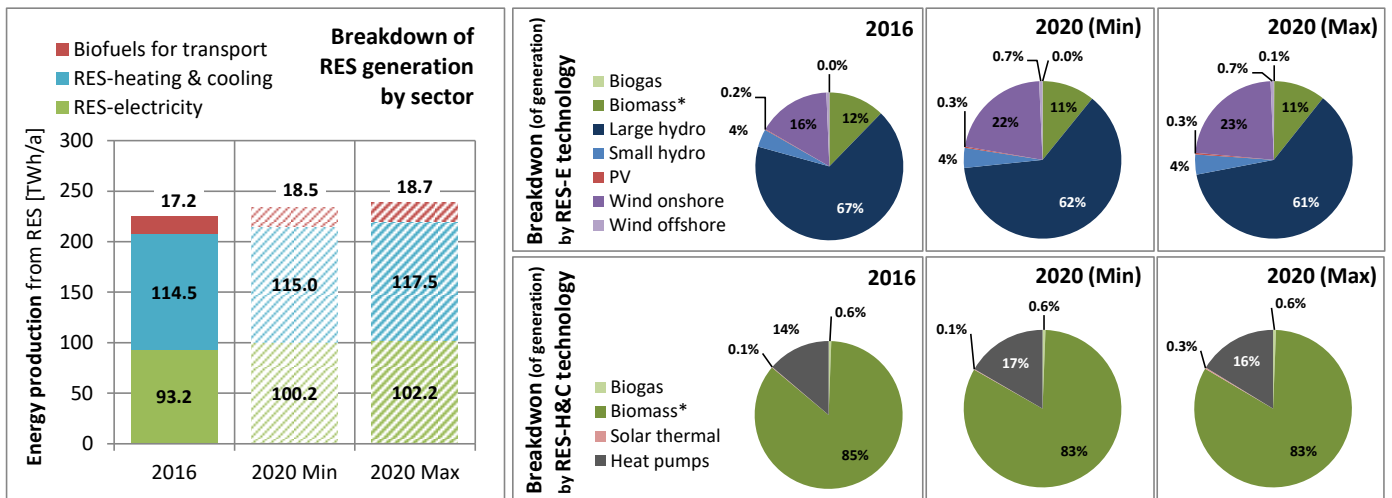
- The support scheme does not balance electricity market price fluctuations
- Insufficient grid capacities particularly affect the development of wind power projects
- Right of Swedish Armed Forces to withdraw permissions and dismantle wind turbines creates insecurity

Heating and Cooling

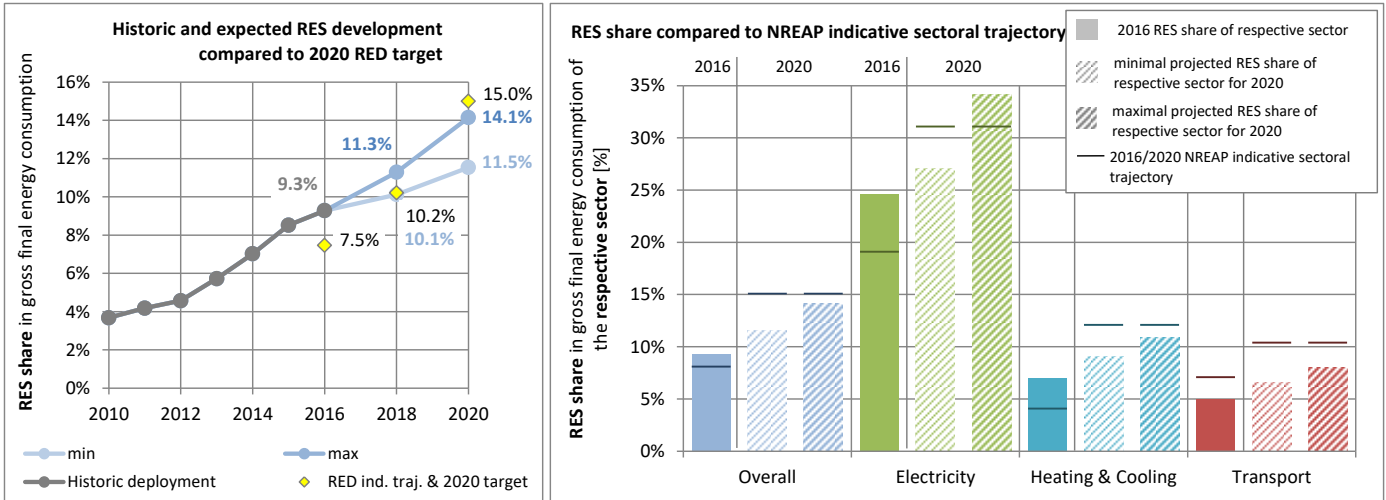
- Low prices of electricity and electricity certificates jeopardize profitability of CHP plants
- Lack of awareness of the benefits of RES in public discussion

Transport

- Insufficient policy instruments to support the use of RES fuels
- The existing support scheme do not cover all types of biofuels



United Kingdom



Indicator	Overall	Electricity	H&C	Transport
2016 actual RES share in sectoral gross final energy consumption	9.3%	24.6%	7.0%	4.9%
2016 NREAP trajectory	8.0%	19.0%	4.0%	7.0%
2015/2016 indicative interim trajectory (set by RED)	7.5%			
2018 projected RES share in sectoral gross final energy consumption (min-max)	10.1 - 11.3%	24.7 - 27.7%	7.7 - 8.8%	5.9 - 6.6%
2018 NREAP trajectory	11.0%	25.0%	7.0%	8.6%
2017/2018 indicative interim trajectory (set by RED)	10.2%			
2020 projected RES share in sectoral gross final energy consumption (min-max)	11.5 - 14.1%	27.1 - 34.1%	9.1 - 10.9%	6.6 - 8%
2020 NREAP trajectory	15.0%	31.0%	12.0%	10.3%
2020 target (set by RED)	15.0%			

Target achievement: status quo and outlook

- The projected RES share in gross final energy consumption 2020 is between 11.5% and 14.1%, compared to a 15.0% 2020 RED target. Hence, the UK should take additional policy measures and consider the use of statistical transfer to reach its 2020 RED target.
- The projections show that just the RES-E NREAP trajectory may be met in 2020, with a projected share in this sector of 27.1% to 34.1%. The RES- H&C NREAP trajectory for 2020 is expected to be missed by 2.9 pp to 1.1 pp. In 2016, the RES-E NREAP trajectory was surpassed by 5.6 pp, the RES-H&C NREAP trajectory by 3 pp and the overall indicative NREAP RES trajectory by 1.3 pp. In the transport sector, the NREAP indicative trajectory of 7% in 2016 was missed by 2.1 pp.

Main policy instruments:

- RES-E:** The Contract for Difference (CfD) scheme replaced the Renewables Obligation (RO) scheme as the main RES-E support scheme in 2014. Two CfD allocation rounds were successfully completed in March 2015 and September 2017, delivering around 5.4 GW of new generating capacity. A third auction round is planned for spring 2019.
- RES-H&C:** The Renewable Heat Incentive is the main support scheme providing premium payments per kWh of renewable heat produced. Eligible technologies are biomass boilers and biomass pellet stoves, heat pumps and solar thermal panels. A Zero Carbon Homes regulation announced in 2006, which aimed at obliging all new homes to be zero carbon from 2016, was abandoned.
- RES-T:** A quota system for biofuels is the main instrument for RES-T support. Recent changes to the quota system more than doubled the biofuels obligation level from 4.75% in 2017-18 to 9.75% in 2020, and introduced additional annual targets up to 2032. In addition, several measures regarding electric mobility have been adopted in recent years, aiming at behavioral change of end consumers. These include grants for plug-in hybrids and e-mobility charging schemes. However, in October 2018, the Department for Transport announced plans to reduce the grant level for electric vehicles from £4.5k to £1k and scrap grants for hybrid vehicles.

Barriers to RES deployment

In all sectors (electricity, heating & cooling and transport) the deployment of renewable energies in the UK faces important barriers related to deficient support schemes and building and planning issues. Complex administrative issues are also identified as a significant barrier in the electricity sector.

Electricity

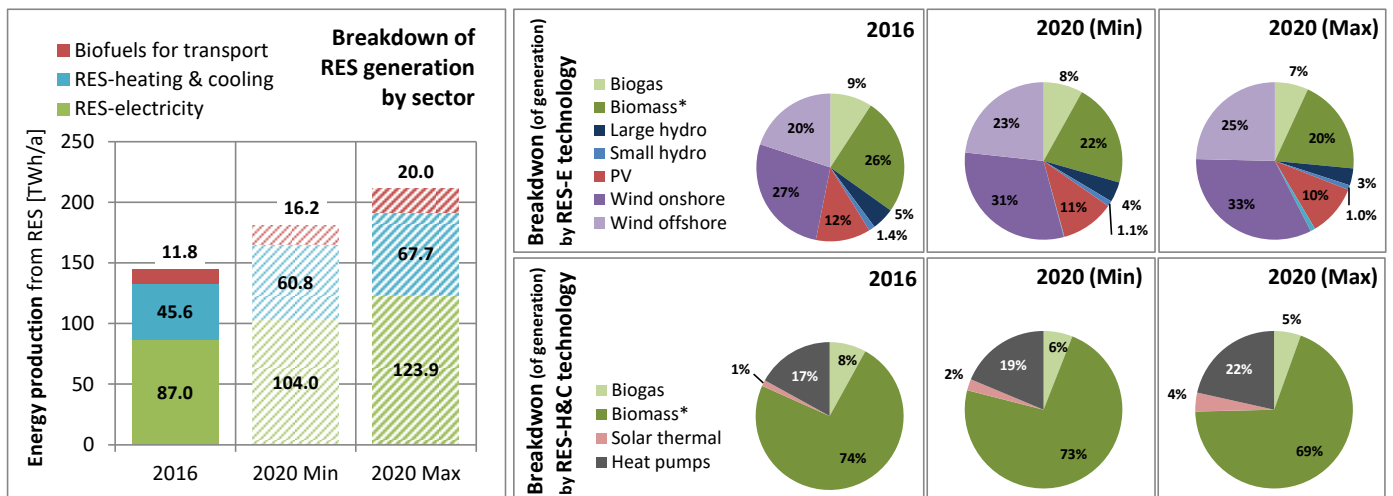
- Lack of long-term time schedule for CfD rounds
- Lack of existing support scheme for RES in Northern Ireland
- Insufficient grid capacity for additional RES installations, particularly in Wales
- Strict planning restriction surrounding onshore wind

Heating and Cooling

- Policy risk for investors resulting from the lack of predictability of the support scheme duration and budget
- Lack of expertise of municipal authorities regarding the management of renewable heating networks
- Complex administrative procedures for RES-H&C installations

Transport

- UK's blending cap of 2% for first generation biofuels is considerably lower than the EU's cap of 7%
- Lack of adequate infrastructure (i.e. refuelling and charging stations for biofuels and e-vehicles)



ECOFYS



A Navigant Company