



20-20
KEEP ON TRACK!

EU TRACKING ROADMAP

2013

**KEEPING TRACK OF RENEWABLE ENERGY
TARGETS TOWARDS 2020**



EREC

EUROPEAN RENEWABLE ENERGY COUNCIL



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WHO IS EREC?

EREC, the European Renewable Energy Council, is the umbrella organisation of the major European renewable energy industry, trade and research associations active in the field of photovoltaics, small hydropower, solar thermal, bioenergy, geothermal, wind energy, and solar thermal electricity. It now has 10 members, which in turn, comprise globally active companies within their membership. EREC represents an industry with an annual economic activity of more than €130 billion employing more than 1 million people. EREC shares its offices with its member associations in the Renewable Energy House in Brussels, a model showcase for integration of energy efficiency and renewable energy technologies in a historic building.

EREC'S MEMBERS:

 AEBIOM (European Biomass Association)	 EGEC (European Geothermal Energy Council)	 EPIA (European Photovoltaic Industry Association)	 EREF (European Renewable Energies Federation)	 ESHA (European Small Hydropower Association)
 ESTELA (European Solar Thermal Electricity Association)	 ESTIF (European Solar Thermal Industry Federation)	 EUBIA (European Biomass Industry Association)	 EUREC Agency (European Association of Renewable Energy Research Centres)	 EWEA (European Wind Energy Association)

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THE KEEP ON TRACK! PROJECT

The 2009/28/EC Directive on the promotion of the use of energy from renewable sources¹ (referred to in this publication as the “RES Directive”) sets the objective of reaching at least 20% of the EU’s final energy consumption with renewable energy sources by 2020. It sets for each Member State mandatory national targets for the overall share of renewable energy sources (RES) in gross final energy consumption. The annex to the Directive also defines an indicative trajectory for RES developments leading to the 2020 objectives. Progress towards reaching the 2020 targets is carefully monitored to ensure that actual developments are not lagging behind the trajectory outlined in the RES Directive. With this aim and building on the experience of the Intelligent Energy Europe (IEE) project REPAP2020, the Keep on Track! project offers market, legal and political advice and recommendations for EU Member States to stay on track with the objectives set for 2020.

This is done via a platform for discussion among different market actors such as renewable energy industry associations, national and EU Parliamentarians and the scientific community. Moreover, the project ensures a close-to-market monitoring of the fulfilment of the RES trajectory for each of the 27 EU Member States and for Croatia in 2015.

If a Member State is found to be lagging behind and is failing to overcome identified barriers for RES deployment, the Keep on Track! project will provide early warnings and suggest solutions on how to compensate any possible delay encountered.

KEEP ON TRACK! PARTNERS:

The European Renewable Energy Council (EREC) is the project coordinator. Partners in the projects are:

 eufores EUROFORES - The European Forum for Renewable Energy Sources	 BEE Bundesverband Erneuerbare Energie e.V. BEE - Bundesverband Erneuerbare Energie	 Energy Economics Group EEG - Vienna University of Technology, Energy Economics Group	 Fraunhofer ISI Fraunhofer Institute for Systems and Innovation Research	 eclareon Eclareon	
 BBH Becker Büttner Held BBH - Becker Büttner Held	 APEE Association of Producers of Ecological Energy APEE - Association of Producers of Ecological Energy	 APER ASSOCIAZIONE PRODUTTORI ENERGIA RINNOVABILE Associazione Produttori Energia Rinnovabile	 APPA Asociación de Productores de Energías Renovables APPA - Asociación de Productores de Energías Renovables	 APREN Associação Portuguesa de Energias Renováveis APREN - Associação Portuguesa de Energias Renováveis	
 Erneuerbare Energie Österreich EEÖ - Bundesverband Erneuerbare Energie Österreich	 edora Fédération de l'Energie d'origine renouvelable et alternative EDORA - Fédération de l'Energie d'origine renouvelable et alternative	 GREEK ASSOCIATION OF RES ELECTRICITY PRODUCERS GAREP - Greek Association of RES Producers	 PIGEO Polish Economic Chamber of Renewable Energy PIGEO - Polish Economic Chamber of Renewable Energy	 REA RENEWABLE ENERGY ASSOCIATION REA - Renewable Energy Association	 SERO Sveriges Energiföreningars Riksorganisation SERO - Sveriges Energiföreningars Riksorganisation

Visit the project website to learn more: WWW.KEEPONTRACK.EU

Co-financed by IEE

¹ Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC



AIM OF THE PUBLICATION

The EU Tracking Roadmap is an annual publication which will be released each year from 2013 until 2015.

It monitors the progress of renewable energy deployment towards the 2020 target both at a EU and Member State level. It will do so by providing:

- An analysis of deviations of RES developments compared to the indicative trajectory defined by the RES Directive. This contribution is provided by the Fraunhofer Institute.
- An analysis of barriers to RES deployments. This analysis is put together by eclareon.
- Policy recommendations on how to keep on track with the indicative trajectory defined by the RES Directive. The national policy recommendations are provided by the national RES industry associations for their respective Member States. European policy recommendations are drafted by EREC.

In the 2013 publication, only the 11 EU Member States represented in the Keep on Track! consortium are referred to. However, all EU Member States will be taken into account in the following publications as of 2014, including Croatia in 2015.

This publication summarises the findings of the Keep on Track! project:

- To access more detailed information on the deviations of each EU Member State from its indicative trajectory or on national barriers to RES deployment, please visit the Keep on Track! website - www.keepontrack.eu - and read the [Analysis of Deviations and Barriers Report](#).
- Furthermore, the [Policy Recommendations Report](#) will provide you with more insights into national policy recommendations.



EXECUTIVE SUMMARY

ARE EU MEMBER STATES ON TRACK?

The EU as a whole is on track to reaching its 20% RES target by 2020, with a renewable energy share of 13% in 2011. 21 Member States had already met in 2011 the 2011/2012 interim targets set by the 2009/28/EC RES Directive, with only six still needing to make additional efforts. This is not surprising given the relatively low ambition level of the interim targets in the early years. However, trajectories will become steeper in the run-up to 2020.

- **In the renewable electricity sector (RES-E sector), 14 Member States overachieved the 2011 targets** they had set in their National Renewable Energy Action Plans (NREAPs), while 13 underachieved them. The 2010-2011 growth rates of 16 Member States would be sufficient to achieve 2020 targets if they could be maintained. With the recent deterioration of support schemes in many Member States, however, this is looking unlikely.

- **In the renewable heating and cooling sector (RES-H&C sector), 23 Member States were above their 2011 NREAPs targets** and just four Member States underachieved. However, only eight Member States had growth rates from 2010 to 2011 that would be sufficient to reach 2020 targets if they were to be maintained.

- **Renewables in the transport sector (RES-T sector) have seen slower progress than in the former two sectors, with only nine Member States having reached or exceeded their NREAPs 2011 targets**, and 18 having underperformed. Only ten Member States had growth rates from 2010 to 2011 that would be sufficient to reach 2020 targets if they were to be maintained.

THE ACHIEVEMENT OF THE 2020 RES TARGETS IS STILL HINDERED BY NUMEROUS BARRIERS:

The majority of barriers identified result from **RES strategy and legislation shortcomings**, characterised for instance by a lack of long-term vision on behalf of decision makers as well as unclear national legislative frameworks. The second most important barrier category common to the RES-E, RES-H&C and RES-T sectors is the **the instability of national support mechanisms** as well as, for certain technologies, **insufficient levels of incentives**. Numerous barriers common to the three sectors are caused by insufficient RES information, knowledge and/or skills from the professional sector and decision makers.

HENCE, THE KEEP ON TRACK! CONSORTIUM RECOMMENDS TO:

- 1** Create and implement predictable and stable legislative frameworks for renewable energy sources in the 27 EU Member States.
- 2** Remove administrative barriers.
- 3** Fully implement the internal energy market.
- 4** Ensure true fossil fuel and CO₂ prices.
- 5** Provide a thorough analysis of the energy prices and the tariff deficit existing in certain Member States.

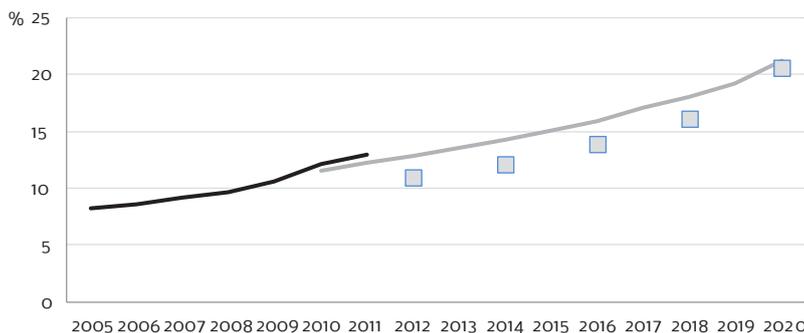


EU OVERVIEW

THE EUROPEAN UNION IS CURRENTLY ON TRACK IN TERMS OF ITS INDICATIVE TRAJECTORY.

The European Union is so far above the 2011/2012 interim target defined in the RES Directive (which constitutes minimum values to be achieved according to the RES Directive). This good result is not surprising given that the interim targets set by the Directive are not ambitious in the early years, however the trajectory will become steeper closer to 2020.

RES SHARE IN GROSS FINAL ENERGY CONSUMPTION

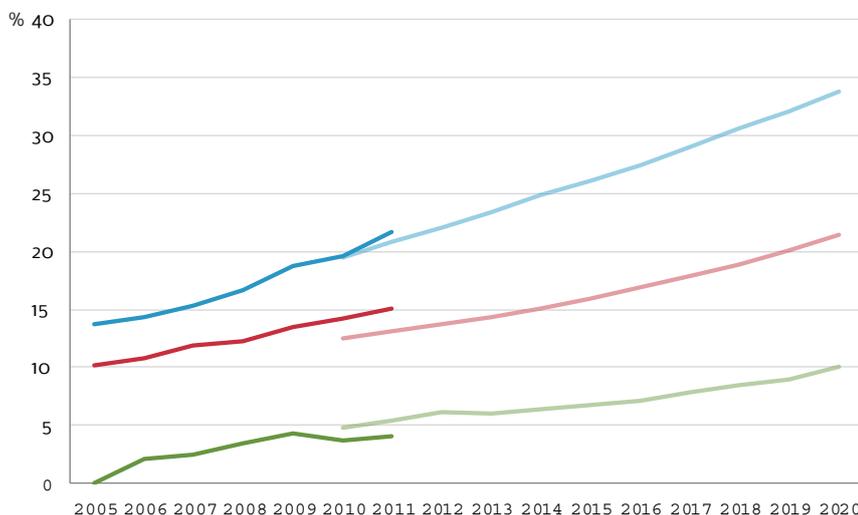


- actual overall RES share
- NREAP overall RES trajectory
- minimum trajectory defined in the RES Directive

Figure 1: Actual EU-27 overall RES share from 2005 to 2011 and NREAP planned shares. (Actual shares are tentative for BE, DK, FI, EL, HU, MT, SE, and SK). To give an impression of the remaining trajectory, RES shares until 2020 are presented as planned in the National Renewable Energy Action Plans ("NREAP overall trajectory") and according to the biannual interim targets set in the RES Directive ("minimum trajectory defined in the RES Directive"). Source: Fraunhofer ISI based on Eurostat and other sources.

Regarding the sectors, the shares in the RES-H&C sector and the RES-E sector are higher than planned, while the RES-T share is lagging behind.

RES SECTOR SHARE IN FINAL SECTORAL ENERGY CONSUMPTION



- actual RES-E share
- NREAP RES-E trajectory
- actual RES-H share
- NREAP RES-H trajectory
- actual RES-T share
- NREAP RES-T trajectory

Figure 2: Actual EU-27 sectoral RES shares from 2005 to 2011 and shares planned in the NREAPs. (Actual shares are tentative for BE and HU). To give an impression of the remaining trajectory, RES shares until 2020 are presented as planned in the NREAPs. Source: Fraunhofer ISI based on Eurostat and other sources.

21 Member States are on track in terms of the 2011/2012 interim targets defined in the RES Directive. Only the United Kingdom (UK), the Netherlands, Malta, Luxembourg, Latvia and France have so far failed to meet their indicative trajectories for 2011/2012 (based on 2011 data).

In 2011, 16 Member States (compared to 20 in 2010) overachieved the targets they had set themselves in the National Renewable Energy Action Plans (NREAPs) submitted to the European Commission, while eleven Member States missed theirs. NREAP targets are targets Member States voluntarily committed to.

They are generally more ambitious than the interim targets defined in the RES Directive.

ACTUAL VERSUS PLANNED RES SHARES

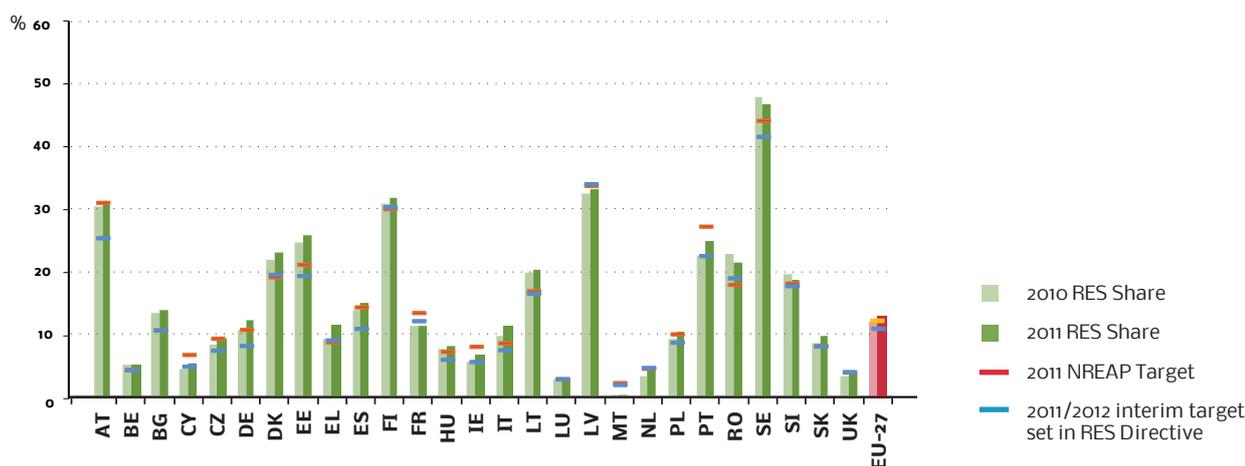


Figure 3: Actual overall RES Share in 2010 and 2011 vs. 2011/2012 interim targets of the RES Directive and 2011 NREAP targets (in %). (shares are estimated by Eurostat for Hungary, and estimated by Fraunhofer for Belgium. Final figures will confirm whether Belgium is on track?). Please note that, should the NREAP target and the interim target coincide, only the latter is visible in the graph. Source: Fraunhofer ISI based on Eurostat and other sources.³

Regarding renewable electricity, 14 Member States were above the NREAP targets in 2011. 13 Member States remained below their targets, compared to 15 in 2001. No data was available for Malta.

ACTUAL VERSUS PLANNED RES-E SHARES

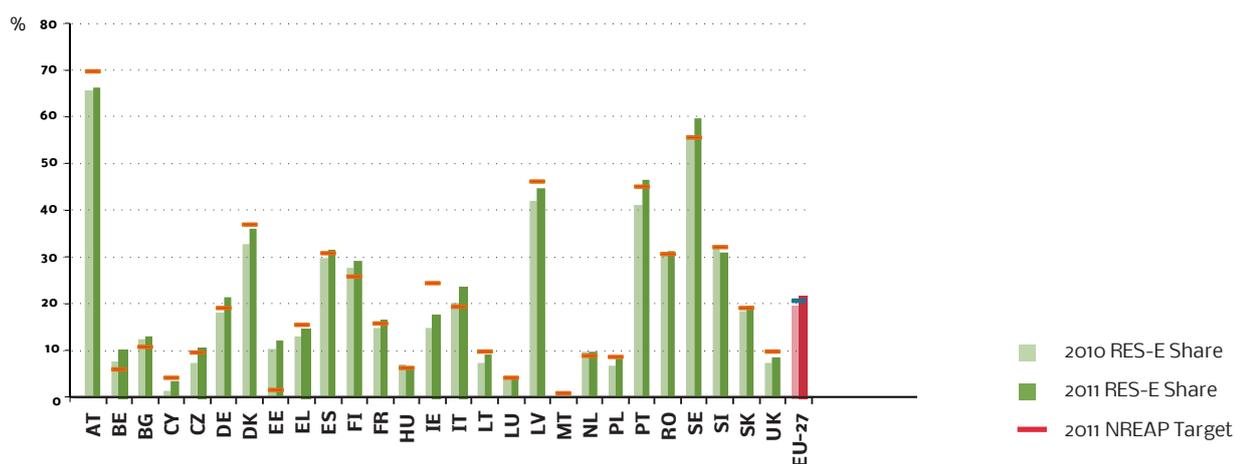


Figure 4: RES-E shares vs. NREAP targets (shares are estimated by Eurostat for Hungary, and estimated by Fraunhofer for Belgium). Source: Fraunhofer ISI based on Eurostat and other sources.

² At the time of writing, only preliminary shares data from Eurostat were available for Belgium, resulting in a share of 4.1%, which would mean that Belgium achieves neither its 2011 NREAP target nor its 2011/2012 interim target. This is due to the fact that, for lack of information, Eurostat assumed zero compliant biofuels in the transport sector. Fraunhofer assumes all 348 ktoe of liquid transport biofuels to be compliant to sustainability criteria. Combined with higher values for PV and wind electricity production, this results in a share of 5.26%. The true RES share is within this range and must be confirmed by final data.

³ The methodology for statistical data collection can be found on page 48 of this publication.

In the RES-H&C sector, 23 Member States were above their NREAP targets in 2011 (compared to 21 in 2010) and only four Member States underachieved in terms of their NREAP targets.

ACTUAL VERSUS PLANNED RES-H&C SHARES

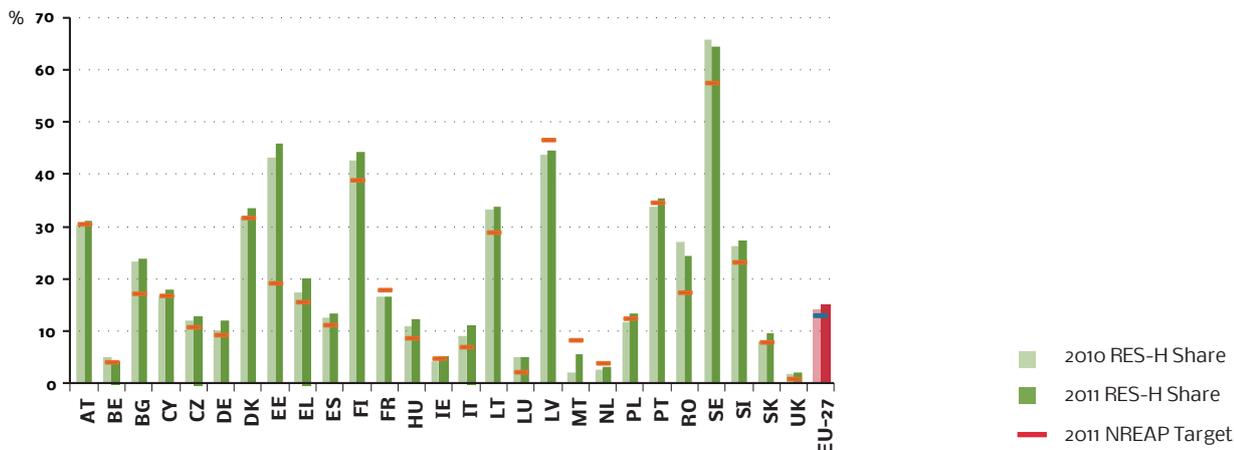


Figure 5: RES-H shares vs. NREAP targets (shares are estimated by Eurostat for Hungary, and estimated by Fraunhofer for Belgium⁵). Source: Fraunhofer ISI based on Eurostat and other sources.

The RES-T sector has seen a significant shortfall, with less progress made than in the other two sectors. Only nine Member States met or exceeded in 2011 their 2011 NREAP targets, and 18 were below them. The situation has therefore slightly deteriorated since the previous year, when eleven Member States had exceeded their target, one had been just on track, and 15 had missed their targets.

ACTUAL VERSUS PLANNED RES-T SHARES

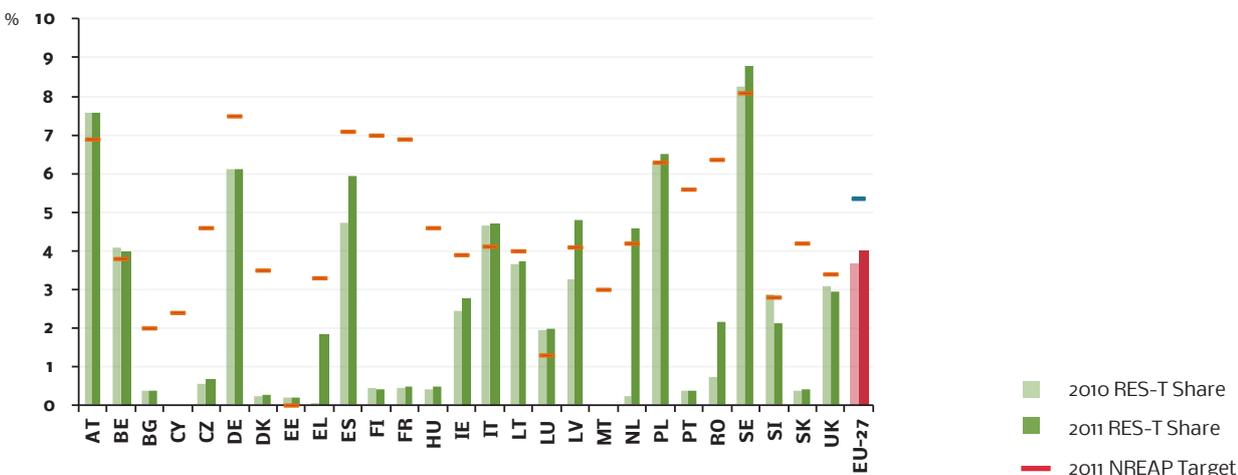


Figure 6: RES-T shares vs. NREAP targets (shares are estimated by Eurostat for Hungary, and estimated by Fraunhofer for Belgium). Source: Fraunhofer ISI based on Eurostat and other sources.

Growth rates achieved in the renewable electricity sector in the EU-27 are in line with what is needed to achieve the production planned for 2020, provided they are maintained. In contrast, growth rates for RES-T remain slightly too low. Growth rates in RES-H&C production were even negative (possibly also due to a reduced overall heat demand during the mild winter), resulting in an insufficient overall growth rate. If the envisioned RES production is to be achieved, growth has to be accelerated significantly.

⁴ Please note that the 2011 NREAP target for the UK does not consider the renewable heat from biomass and biogas CHP, which are included in the actual 2011 RES Share.

2010-2011 RES GROWTH RATES VS. AVERAGE ANNUAL GROWTH RATES REQUIRED TO MEET THE 2020 TARGET

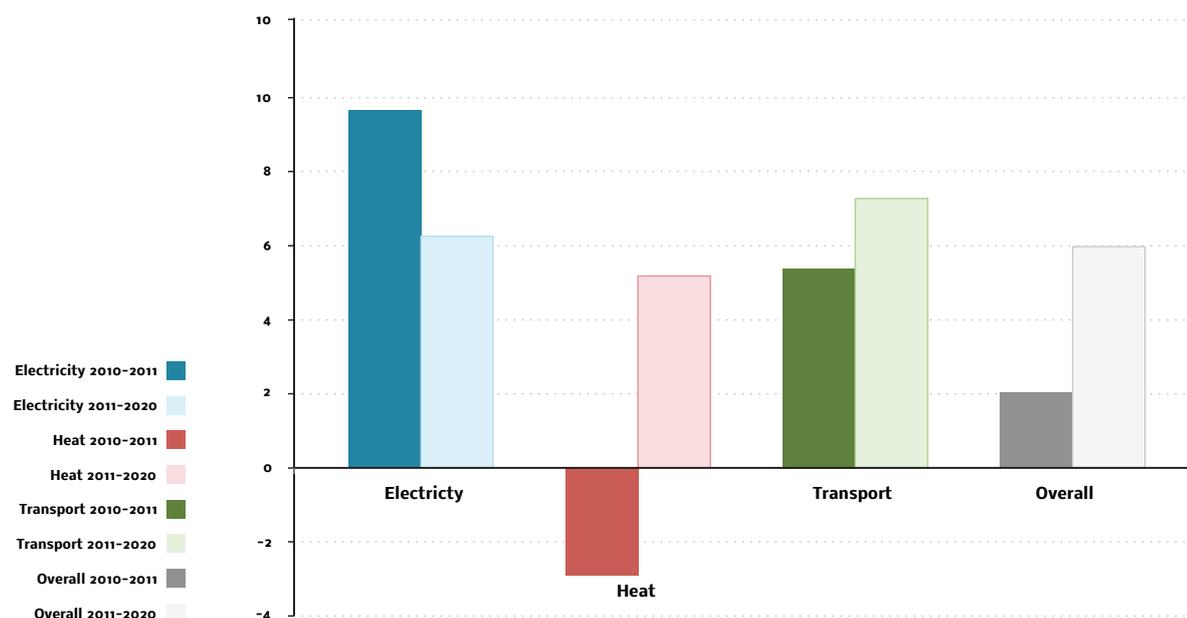


Figure 7: RES overall 2010-2011 growth rates [%/a] and average annual growth rate [%/a] required from 2011-2020 to achieve the 2020 target. Source: Fraunhofer ISI based on Eurostat and other sources. This graph is based on growth rates of absolute production figures, not shares, and is therefore not affected by changes in overall energy demand.



EU MEMBER STATES

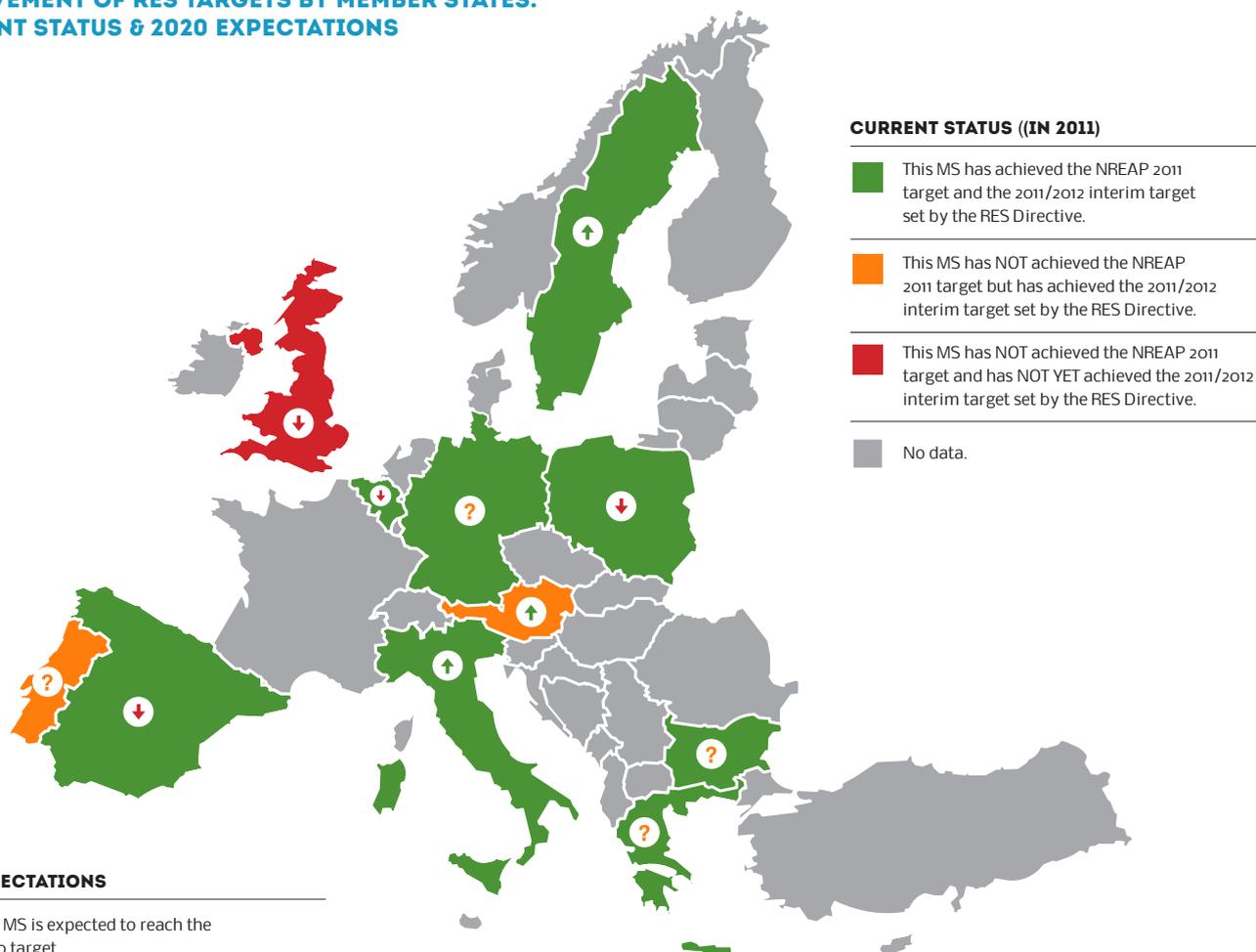
Progress Reports

In December 2011, Member States were required by the RES Directive to present progress reports on renewable energy developments that had taken place since the adoption of the Directive in 2009. These progress reports show that the EU had already met in 2010 the milestone established for 2012. Thanks to the setting of the binding 20% renewable energy target by 2020 and the legislative framework offered by the RES Directive, EU Member States were able to offer an appropriate framework for investments in the renewable energy sector. However:

- Progress reports in many countries are overly positive as they focus on 2010 developments.
- Progress reports do not assess the difficulties that the renewable energy industry is currently facing and do not propose policy solutions.
- Many reports present the policy measures adopted but do not report on problems encountered during the implementation.

Indeed, in the last few years, several Member States have introduced abrupt regulatory changes such as retrospective changes (e.g. in Spain and Bulgaria) and moratoria on new RES developments (e.g. in Spain and Portugal). These abrupt changes destroy investor confidence. By introducing them, EU Member States make it more difficult for themselves to meet the 2020 renewable energy targets later on. Recent abrupt changes can have a strong impact on prospects for achieving the 2020 RES targets.

ACHIEVEMENT OF RES TARGETS BY MEMBER STATES: CURRENT STATUS & 2020 EXPECTATIONS



The key Member States in focus in this publication are the eleven Member States partners in the project namely: Austria, Belgium, Bulgaria, Germany, Greece, Italy, Poland, Portugal, Spain, Sweden and the United Kingdom. This publication will hence focus on these eleven Member States for the following in-depth analyses.

The map above provides an overview of the eleven Member States in terms of whether or not they have achieved their 2011 targets (both the 2011/2012 interim targets set in the RES Directive and the NREAP 2011 targets). The map shows expectations regarding their meeting the 2020 targets.

The 2020 expectations are based on:

1. qualitative judgments by the respective national renewable energy associations,
2. the analysis of barriers provided by eclareon,
3. a quantitative assessment by Fraunhofer ISI based on whether RES growth rates between 2010 and 2011 will be sufficient to achieve 2020 planned deployment.

Out of the eleven Member States analysed in this publication, three are expected to meet their 2020 targets (Austria, Italy and Sweden). There are doubts concerning four Member States (Bulgaria, Germany, Greece and Portugal). It is expected that Belgium, Poland, Spain and the UK will not meet their 2020 targets.

ACHIEVING THE 2020 TARGETS: STILL MANY BARRIERS AHEAD

The Keep on Track! project analyses the barriers hindering the development of renewable energy sources across all three energy sectors in the European Union. To this end, a bottom-up approach has been adopted so as to identify the broadest barriers at national level. Barriers identified were classified under global categories allowing for a comparison across Member States.

AS A CONSEQUENCE OF THE CHOSEN APPROACH:

- The non-identification of a barrier in a certain country does not necessarily mean that it does not exist. Other national barriers may have been perceived as more important or more urgent and were therefore prioritised.
- The identification of a large number of barriers in a specific Member State does not necessarily correlate with the degree of severity of the overall situation for

renewables. The identification of a large number of barriers might be the result of high barrier awareness in certain countries, favoured by high transparency or a high level of availability of information. Moreover, the number of barriers may also depend on the development stage of a certain technology: a high number of barriers would therefore be the outcome of technology maturity.

In total, 280 single barriers have been reported over all sectors in eleven Member States. These breakdown to 160 barriers for the electricity sector, 82 for the heating sector and 49 for the transport sector.

SHARE OF BARRIER CATEGORIES IN RES SECTORS

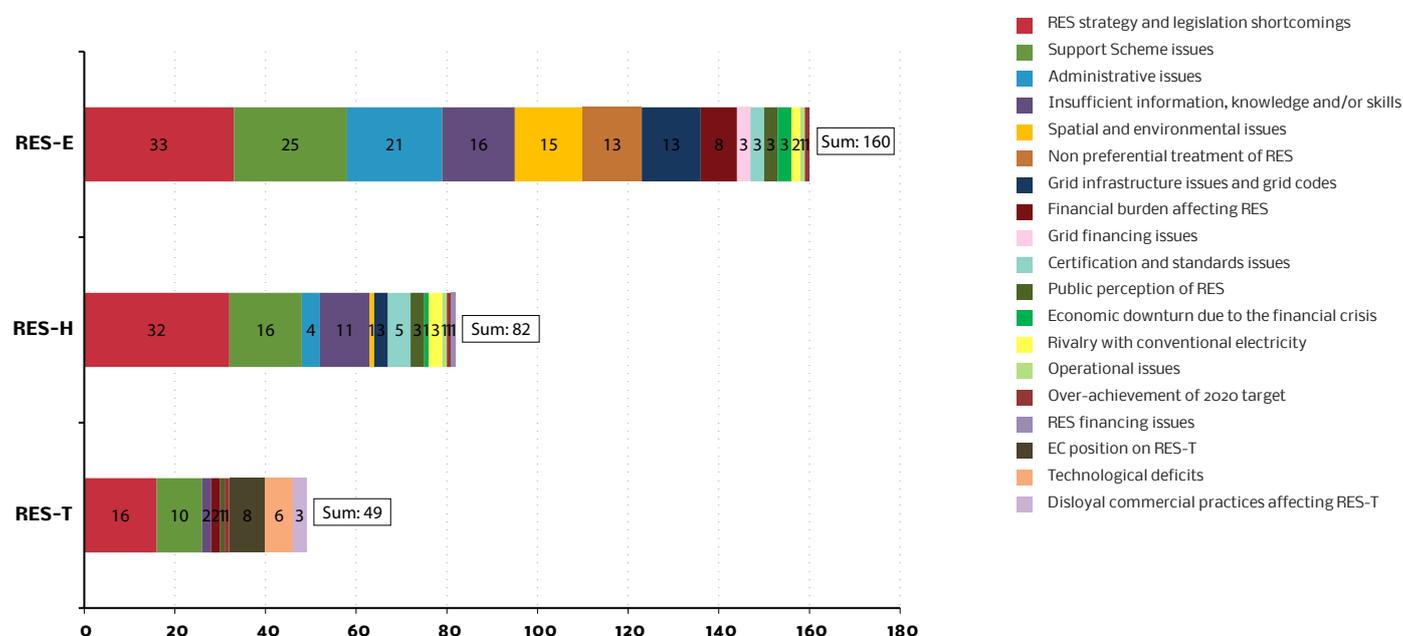


Figure.8: Share of Barrier Categories in RES Sectors. Source: eclareon based on own research and information from the eleven national renewable energy associations partners in Keep on Track!

The category of barriers common to all sectors and thus deemed most important is that of **RES strategy and legislation shortcomings**, gathering 81 out of 280 barriers over all sectors. This category refers, among other issues, to barriers resulting from a lack of long-term vision on behalf of decision-makers, unclear policy frameworks or a lack of harmonised positions among decision makers.

The second category, **support scheme issues**, is also common to all three sectors in terms of number of barriers as well as number of Member States affected. Here barriers relate to the uncertainty and instability of support scheme mechanisms as well as, in some cases, the insufficient level of incentives. As far as the transport sector is concerned, the majority of barriers reported pertain to

biofuels. Yet, issues such as the lack of targeted mechanisms for electric vehicles have also been flagged.

The third category common to all three sectors concerns the issue of **insufficient information, knowledge and/or skills** of the professional sector and of decision makers on RES. For example, numerous barriers refer to the lack of technical expertise of installers and experts as well as to insufficient information and studies available on RES.

Another important barrier is the insufficient knowledge of responsible authorities on RES, leading among others to issues related to local spatial development plans, especially in the RES-E sector.

Another common barrier deals with **administrative issues**. Interestingly enough, an important number of barriers under this category have been identified both in the RES-E and in the RES-H&C sector, but no barrier was reported in the RES-T sector. This could be explained by the fact that in most of the eleven Member States analysed, the RES-T sector is less developed or is subject to a lesser degree of barrier awareness than the RES-E and RES-H&C sectors. As a consequence, fewer barriers could be identified for RES-T at this stage of the project.

A large set of categories identified remain sector-specific and have to be addressed accordingly. Two important categories were for instance identified exclusively in the RES-T sector.

Firstly, several barriers refer to the issue of technological deficits, hindering both the development of electric vehicles (battery

issues) and of biofuels (incompatibility of old engines with the use of biofuels).

Secondly, the uncertain position of the European Commission on biofuels (especially concerning the cap on the amount of crop-based biofuels, the indirect land use change coefficients and discussions about double and quadruple counting of biofuels) forms the second most important barrier for the RES-T sector.

It is interesting to note that the barriers category referring to the non-preferential treatment of RES appears to be specific to the RES-E sector. The main barriers under this category result from discriminatory practice towards certain RES-E technologies as well as from the failing support of decision makers (with a tendency for governments to focus on costs alone due to the strong influence of conventional energy lobby groups)⁵.

EUROPEAN RECOMMENDATIONS

1 CREATE AND IMPLEMENT A MORE PREDICTABLE AND STABLE LEGISLATIVE FRAMEWORK FOR RES AT NATIONAL LEVEL

This call is echoed by all national RES associations of the Keep on Track! consortium. Governments should introduce more stability and reliability to their policies if the sector is to maintain investment and create new jobs in the RES sector.

2 FULLY IMPLEMENT THE INTERNAL ENERGY MARKET

- End regulated energy prices, thereby preventing the issue of tariff deficits coming back on the political agenda.
- Phase out fossil fuels subsidies, thereby helping EU Member States to reduce their public debt and cut inefficient spending.
- Ensure more competition in the market, thereby ensuring that consumers can choose independent renewable energy producers.

3 ENSURE TRUE FOSSIL FUEL AND CO₂ PRICES

Include the externalities of fossil fuels and nuclear energy into their prices. Governments should have a true idea of the price of each technology and its impact on society across all sectors (health, climate, environment, etc...).

4 PROVIDE A THOROUGH ANALYSIS OF THE ELECTRICITY PRICES AND THE TARIFF DEFICIT

RES are often judged responsible for tariff deficits: tariff deficits are due to the regulated prices put in place by national governments which do not reflect increasing energy costs. Governments are misguided when removing support to RES to find a solution to the tariff deficit.

5 REMOVE ADMINISTRATIVE BARRIERS

The removal of administrative barriers is a neutral measure in terms of State budget that does improve the investment climate for RES. Governments should improve their analysis of, and implement measures to remove administrative barriers. These measures are very cost-effective and could improve the investments forecasts of producers significantly, thereby decreasing the costs of RES.

BENEFITS OF RENEWABLES IN THE EU:

- The EU renewables sector directly and indirectly employed in 2011 about 1.2 million people, an increase of 30% on the 2009 figure⁷. By 2020, 2.7 million people in the EU could be employed by the renewables sector⁸.
- The economic activity of all 27 Member States for 2011 stemming from renewable energy is valued at about €137 billion - a 14% increase on 2009⁹.
- In 2011, the EU's combined trade deficit was €150 billion. At the same time the net import bill for fossil fuels to the EU amounted to €388 billion, which is more than 3% of EU GDP, and more than twice the trade deficit. Renewable energy can play a crucial role in reducing the EU's import dependency.

⁵ EurObservER: *The State of Renewable Energies in Europe*. 2012 & 2010[1] REN21: *Renewables 2012. Global Status Report*. 2012.

⁶ To access more detailed information on national barriers to RES deployment, please visit the [Keep on Track! website](#) and read the Analysis of Deviations and Barriers Report.

⁷ EurObservER: *The State of Renewable Energies in Europe*. 2012 & 2010 REN21: *Renewables 2012. Global Status Report*. 2012.

⁸ See both Fraunhofer ISI et al.: *EmployRES. The impact of renewable energy policy on economic growth and employment in the European Union. (2009) and EREC: 45% by 2030. Towards a truly sustainable energy system in the EU*. 2011.

⁹ EurObservER: *The State of Renewable Energies in Europe*. 2012.



ANALYSIS

BY MEMBER STATES



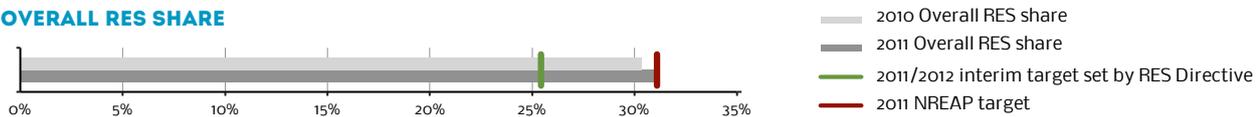
Is Austria ON TRACK?

- Austria has achieved the interim target 2011/2012, but is slightly behind on the NREAP 2011 target due to a negative deviation in the electricity sector share.
- Compared to the prior six year average, growth was slower between 2010 and 2011. The transport sector even experienced negative growth.
- Growth rates are sufficient to achieve the 2020 target for RES overall and in the heat sector. In the electricity and transport sectors, growth needs to accelerate in order to achieve the 2020 target.

Source: Fraunhofer ISI (based on Eurostat and other sources)

To access more detailed information on the deviations of each EU Member State from its indicative trajectory, please visit the Keep on Track! website - www.keepontrack.eu - and read the Analysis of Deviations and Barriers Report.

OVERALL RES SHARE



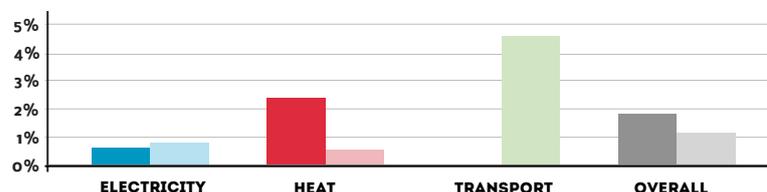
2011 RES SHARE COMPARED TO 2020 TARGET IN SECTORAL GROSS FINAL ENERGY DEMAND



	ELECTRICITY	HEAT	TRANSPORT	TOTAL
2011 actual share of RES in sectoral gross final energy demand	66.1%	31.1%	7.6%	30.9%
2011 NREAP target	69.8%	30.6%	6.9%	31.1%
2011/2012 interim target set by RES Directive	-	-	-	25.4%
2020 NREAP target	70.6%	32.6%	11.4%	34.2%
Percentage of sector consumption in total final energy consumption in 2011	22%	48%	30%	100%
2011 Production [ktoe]	3,997	4,147	583	8,728
2010 Production [ktoe]	3,967	4,361	600	8,928
2005 Production [ktoe]	3,491	3,193	0	6,684
2020 NREAP target production [ktoe]	4,503	4,179	856	9,266
Deviation [%] of actual from planned share in 2011	-5.33%	1.56%	9.61%	-0.54%

2010-2011 RES GROWTH RATES VS. AVERAGE ANNUAL GROWTH RATES REQUIRED TO MEET THE 2020 TARGET

- Electricity 2010-2011
- Electricity 2011-2020
- Heat 2010-2011
- Heat 2011-2020
- Transport 2010-2011
- Transport 2011-2020
- Overall 2010-2011
- Overall 2011-2020





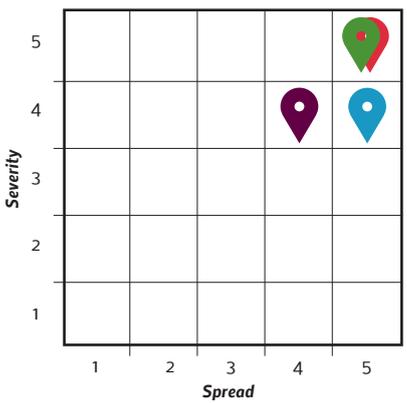
BARRIERS to RES deployment

ELECTRICITY

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
SUBSIDY SYSTEM	Restricted yearly volume for RES subsidies, reducing trust in RES market for companies and RES investors.	
DISCRIMINATION OF RES PRODUCERS	Net grid service fees apply only to domestic RES producers hindering the development of RES and slowing down concrete project implementation.	
LINE ENTRY OF RES INTO THE GAS GRID	High tariffs for accessing and feeding in bio-methane to the existing gas grid. No special RES targets for the gas grid and no guaranteed access of RES into the gas grid.	
ADMINISTRATIVE PROCEDURES	Administrative procedures for subsidies are often delayed, which affects the project planning. The new PV subsidy structure will lead to more complicated project administration.	
WATER FRAMEWORK DIRECTIVE	The implementation of the EU water framework directive can cause some difficulties for the development of hydropower (e.g. expertise in approval process and strict ecological requirements to fulfil).	

HEATING AND COOLING

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
REFURBISHMENT QUOTAS	Low refurbishment quotas hinder the development of RES-H&C especially in existing buildings. This affects mostly bio-energy and solar thermal energy.	
EFFICIENCY CRITERIA FOR HEATING SYSTEMS	To replace existing heating systems with new RES-H&C systems, efficiency criteria are needed. These are discussed within the climate protection law and the energy efficiency law.	
ENERGY PERFORMANCE CERTIFICATES (EPC)	No obligation of Energy Performance Certificates to conduct measures to improve energy efficiency in buildings. No harmonisation of technical regulation for buildings between the federal states.	
NO COMMITMENT FOR SOLAR THERMAL	Conventional systems are only used to produce warm water which is highly inefficient. A national commitment to use solar thermal energy should be implemented.	
FUNDS FOR AGRICULTURAL BIOMASS	The installation of agricultural biomass plants will not be promoted until 2014, hindering the construction of new biomass plants.	

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
 BIOFUEL TARGETS	Austria has reached the 2010 EU targets of 5.75% for renewable energy in transport. Meeting the 10% target by 2020 would be possible in a sustainable way.	
 NO ACTION PLAN FOR ELECTRO-MOBILITY	Switch to electro-mobility in Austria would lead to a higher use of RES in the transport sector because electricity in Austria is mostly produced from hydropower.	
 NO LONG-TERM TAX BENEFITS FOR VEGETABLE OIL	Lack of financial incentives for conversion of diesel engines to vegetable oil. Because of market conditions, the price difference between diesel and vegetable oil is not sufficient to achieve a sustainable economic advantage.	
 ADDITIONAL CARBON CHARGE	The additional carbon charge on plant oil (ILUC), planned for 2013, will impede meeting CO2 emissions reduction target.	

Severity: 1 - almost negligible effects, 2 - minor effects, 3 - moderate effects, 4 - substantial effects, 5 - severe effects

Spread: 1 - impacts sporadic installations, 2 - affects a small fraction, 3 - affects a moderate share, 4 - affects a predominant share, 5 - concerns almost all installations

KEY TRENDS IN THE RES SECTOR

- After years of non-ambitious RES policy, the new Green Electricity Act, implemented in 2012 will be a key driver for faster growth in the RES-E sector.
- Regarding the heating sector, Austria has a favourable starting position with a share of more than 30%. The long-term strategy is to reduce its heat demand and raise refurbishment quotas to 3% a year. The Austrian renewable energy association (EEÖ) expects positive measures in this sector linked to the Climate Protection Act and the Energy Efficiency Act published in Austria this year.
- As the RES share in transport is relatively high, Austria easily fulfils the EU 2010 biofuels target (5.75%). However, further developments are made more difficult due to the suspension by the Government in September 2012 of the introduction of E10.
- EEÖ supports the implementation of more ambitious renewable energy 2020 targets and further targets for 2030 in the following legislative period which begins at the end of 2013.

POLICY RECOMMENDATIONS

ELECTRICITY SECTOR

- Avoid “stop and go support policy” scaring off possible investors. Contract assignments should be better managed to prevent a backlog of submitted projects (“first come, first served”).
- Cancel grid loss fees for producers. Since these costs were not foreseen during the implementation of the projects, they can lead to considerable financing issues and discriminate large domestic renewable energy producers on the Austrian energy trading market.

HEATING AND COOLING

- Implement direct incentives/financial subsidies to raise refurbishment quotas. Low refurbishment quotas explain the slow RES development in the housing sector, especially for bio-energy and solar thermal energy.
- Introduce efficiency criteria for the refurbishment of existing heating systems. The introduction of minimum efficiency criteria for RES installations in households is needed.

TRANSPORT SECTOR

- There should be a national action plan for the implementation of electro-mobility in Austria.
- Introduce tax concessions for vegetable oil.



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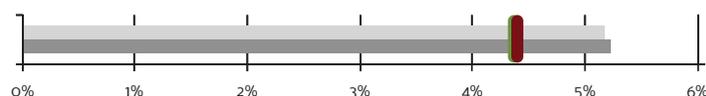
Is Belgium ON TRACK?

- Belgium has met both the 2011/2012 interim target and the 2011 NREAP target due to estimates available at the time of writing. Final data will have to confirm this. (See footnote 2 in the EU overview chapter).
- In the electricity sector, production grew at a constant rate compared to the average growth rate of the previous six years. In the other sectors, overall production decreased slightly from 2010 to 2011.
- With the 2010-2011 growth rate, the overall 2020 target will not be achieved. In 2011, only the growth rate in the electricity sector would be high enough to meet the 2020 target.

Source: Fraunhofer ISI (based on Eurostat and other sources)

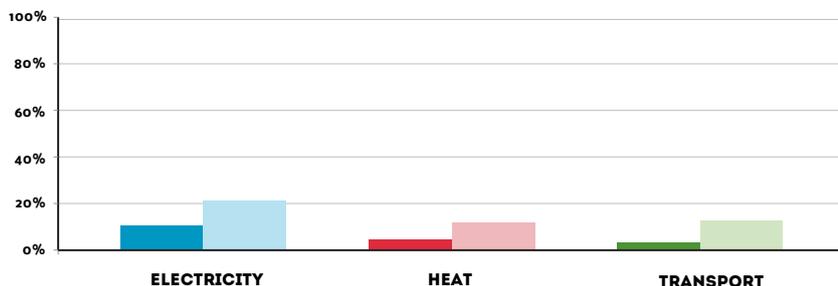
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OVERALL RES SHARE



- 2010 overall RES share
- 2011 Overall RES share
- 2011/2012 interim target set by RES Directive
- 2011 NREAP target

2011 RES SHARE COMPARED TO 2020 TARGET IN SECTORAL GROSS FINAL ENERGY DEMAND

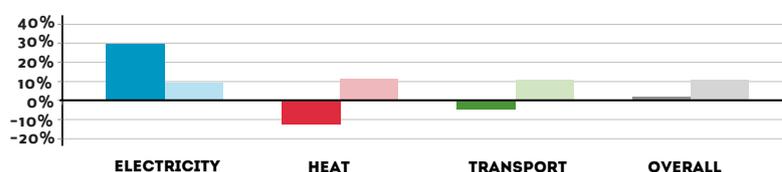


- 2011 RES-E share
- 2020 NREAP RES-E target
- 2011 RES-H share
- 2020 NREAP RES-H target
- 2011 RES-T share
- 2020 NREAP RES-T target

	ELECTRICITY	HEAT	TRANSPORT	TOTAL
2011 actual share of RES in sectoral gross final energy demand	10%	4.4%	4%	5.3%
2011 NREAP target	6.2%	4.2%	3.8%	4.4%
2011/2012 interim target set by RES Directive	-	-	-	4.4%
2020 NREAP target	20.9%	11.9%	10.1%	13%
Percentage of sector consumption in total final energy consumption in 2011	20%	53%	27%	100%
2011 Production [ktoe]	790	923	356	2.069
2010 Production [ktoe]	629	938	369	1.936
2005 Production [ktoe]	181	688	0	869
2020 NREAP target production [ktoe]	1.988	2.588	798	5.374
Deviation [%] of actual from planned share in 2011	62.05%	4.65%	4.57%	19.62%

2010-2011 RES GROWTH RATES VS. AVERAGE ANNUAL GROWTH RATES REQUIRED TO MEET THE 2020 TARGET

- Electricity 2010-2011
- Electricity 2011-2020
- Heat 2010-2011
- Heat 2011-2020
- Transport 2010-2011
- Transport 2011-2020
- Overall 2010-2011
- Overall 2011-2020





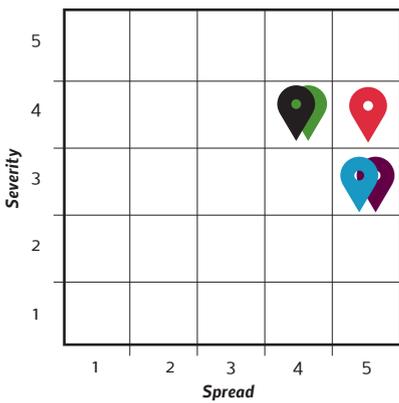
BARRIERS to RES deployment

ELECTRICITY

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
UNCERTAINTY OF SUPPORT MECHANISMS	The green certificate price collapsed due to certificate overstock. The allocation system is under revision. Future project support remains uncertain with the possibility of a retrospective effect on existing plants.	
GRID CAPACITY	Many projects cannot be connected at an acceptable cost due to overcapacity in the grid at some connection points.	
UNCERTAIN PERMIT PROCEDURE	Different competences, unclear criteria and a lack of objective protocols lead authorities to determine their own requirements. In Flanders, environment and construction permits depend on different authorities.	
ENVIRONMENT CONSTRAINTS	Excessive, unscientific environmental constraints exist for wind, biomass, hydro. Lack of coherence between authorities for environmental measures, lack of evaluation protocols and unclear financing for environmental equipment.	
AERONAUTICAL CONSTRAINTS (WIND)	Many wind development sites are under military restrictions. Given the dense population and other constraints, this severely affects the development of onshore wind and the determination of a new offshore zone.	

HEATING AND COOLING

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
RES-H&C FRAMEWORK	Lack of coherent and integrated strategy for RES-H&C. No clear mid-term target for the heating sector and sub-sectors. Administrative framework remains unclear or inappropriate.	
SUPPORT SYSTEM	Insufficient support mechanisms for RES-H&C and biogas (mainly green certificates for CHP and investment supports), leading to insufficient profitability and investment uncertainty.	
HEATING NETWORK	District heating is poorly developed in Belgium. The future development of CHP and other biomass production in the heating sector is not ensured.	

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
 POSITION OF THE EC	Uncertain position of the EC on biofuels, sustainability and efficiency (CO ₂ emissions and arable lands).	
 IMAGE OF BIOFUELS	Biofuels have a negative image. No Member State decided to go beyond the targets set by the RES directive, whereas several MS will exceed the targets for RES-E and RES-H&C.	
 PRIORITY FOR BIOFUELS	Biofuel is not a priority for political stakeholders. Support suffers from political and budgetary difficulties.	
 BOTTLE-NECKS FOR ELECTRIC VEHICLES	Lack of standardisation of electric vehicles and limited battery life of electric batteries.	
 TARGETED INCENTIVES	Electro-mobility remains too expensive. Policy makers abstain from launching targeted support schemes. There are no investments to adapt the electricity grid to electric cars.	

Severity: 1 - almost negligible effects, 2 - minor effects, 3 - moderate effects, 4 - substantial effects, 5 - severe effects

Spread: 1 - impacts sporadic installations, 2 - affects a small fraction, 3 - affects a moderate share, 4 - affects a predominant share, 5 - concerns almost all installations

KEY TRENDS IN THE RES SECTOR

- Belgian policy makers generally see RES as cost-inducing technologies and have limited confidence in its potential. There is a lack of business technology understanding at both ministerial and administrative levels. RES developments are impaired by the lack of coordination between decision makers, uncertainty on support mechanisms, insufficient grid connection capacities, complicated or uncertain permit procedures, and competition with other activities.
- The green certificate system (GC) for RES-E is under revision without certainty on future support with a possible retrospective effect on existing plants. Due to GC oversupply,

the GC price has collapsed to reach the guaranteed price in Wallonia, impacting the profitability of production. The support mechanism is under discussion creating dramatic uncertainty for future developments. Investments are blocked, challenging the realisation of projects for which a permit has already been delivered.

- The main support scheme for RES-H&C deals with GC for Combined Heat and Power (CHP) and investment supports. There is however a dramatic lack of support mechanism for RES heating production and biogas production and injection. This has led to insufficient profitability and investment uncertainty.

POLICY RECOMMENDATIONS



ELECTRICITY SECTOR

- Finalise as soon as possible a stable support system preventing retrospective effects and guaranteeing an acceptable profitability for each RES technology.
- Make sure grid reinforcements are in line with the RES spatial planning timing to guarantee priority access and dispatching to the grid for RES. Curtailment must systematically be compensated.
- Finalise a clear framework for each RES technology based on mid-term targets and on objective criteria. This should be legally secured by relevant legislative initiatives to prevent legal challenges.
- Implement a one-stop shop for each RES technology and coordinate permit delivering procedures.
- Remove some installation constraints taking technical solutions into account.



HEATING AND COOLING

- Develop a clear legal framework to promote RES developments based on clear and binding targets. The framework should be based on clear, objective and reasonable criteria with a balanced approach between the different uses.

- Integrate a specific support for biogas, RES heating production and district heating.
- Develop a spatial planning strategy focused on district heating (DH) linked to a specific support for DH development.



TRANSPORT SECTOR ¹⁰

- Clarify biofuels sustainability criteria and dedicate biofuels to specific applications to improve security of supply and social acceptance.
- Decide on incentives to improve the technology of electric vehicles with the aim of reducing their cost.

¹⁰ (not from EDORA - recommendations taken from eclareon expert interviews realized for their barrier analyses)



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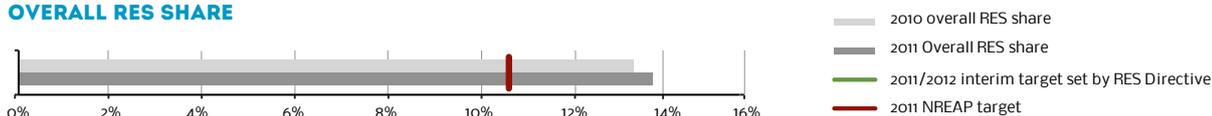
Is Bulgaria ON TRACK?

- Bulgaria has complied with its 2011/2012 interim target and the 2011 NREAP target, although the NREAP target for the transport sector was missed.
- Growth in the heat sector between 2010 and 2011 has slowed compared to the average of the six previous years. In contrast, growth in the electricity and transport sectors accelerated.
- In total, the 2010-2011 growth rate was sufficient to achieve the 2020 target. However, the 2010-2011 growth rates in the electricity and transport sectors were too low.

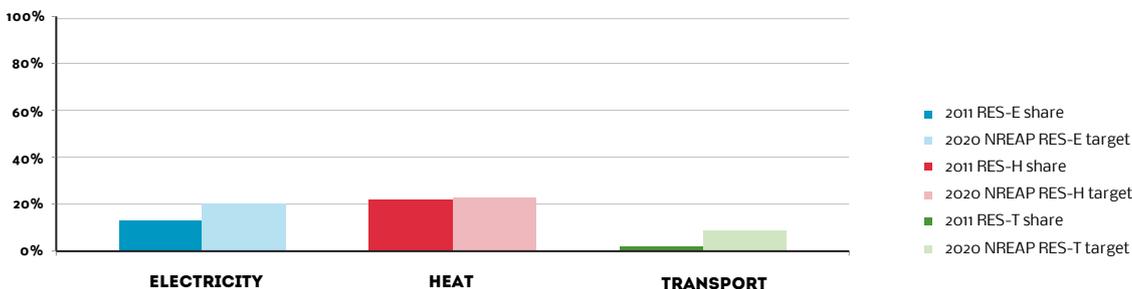
Source: Fraunhofer ISI (based on Eurostat and other sources)

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OVERALL RES SHARE



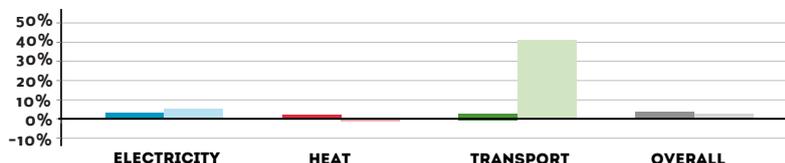
2011 RES SHARE COMPARED TO 2020 TARGET IN SECTORAL GROSS FINAL ENERGY DEMAND



	ELECTRICITY	HEAT	TRANSPORT	TOTAL
2011 actual share of RES in sectoral gross final energy demand	12.9%	23.8%	0.4%	13.8%
2011 NREAP target	11.0%	17.3%	2.0%	10.7%
2011/2012 interim target set by RES Directive	-	-	-	10.7%
2020 NREAP target	20.6%	23.8%	7.8%	16%
Percentage of sector consumption in total final energy consumption in 2011	33%	40%	28%	101%
2011 Production [ktoe]	437	991	6	1.433
2010 Production [ktoe]	405	926	5	1.337
2005 Production [ktoe]	373	732	0	1.105
2020 NREAP target production [ktoe]	648	1.103	205	1.956
Deviation [%] of actual from planned share in 2011	17,33%	37,58%	-81,52	29,04%

2010-2011 RES GROWTH RATES VS. AVERAGE ANNUAL GROWTH RATES REQUIRED TO MEET THE 2020 TARGET

- Electricity 2010-2011
- Electricity 2011-2020
- Heat 2010-2011
- Heat 2011-2020
- Transport 2010-2011
- Transport 2011-2020
- Overall 2010-2011
- Overall 2011-2020





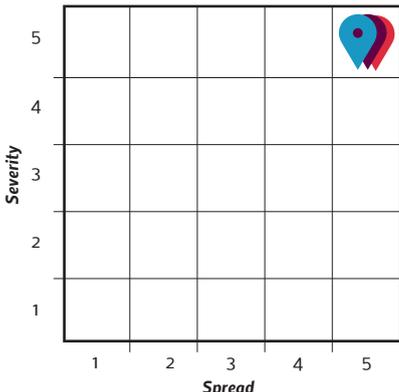
BARRIERS to RES deployment

ELECTRICITY

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
BREACHING OF LAWS	Current government and entities disregard the existing regulation. Even legislation previously adopted and enforced by the National Assembly can be changed.	
ABRUPT AND RETROSPECTIVE MEASURES	Government enforces sudden measures such as cutting off already adopted FiT (up to 40%). Permits issued by ministries are declared null and void for investors/operators having already commissioned their power plants.	
TRANSPARENCY	Lack of transparency in decision taking after public discussions and hearings. No statements, opinions, notes or suggestions are taken into account.	
LEGISLATION AMENDMENTS	Changes of legislation may happen every six months. Laws are created and amended without impact assessments and without long-term planning and coordination between responsible authorities.	
DISCRIMINATION OF RES PROCEDURES	A grid access fee was introduced only for RES plants. RES producers are subjected to complicated administrative procedures. The moratorium proposal for energy producers in 2010 did not apply to conventional power plants.	

HEATING AND COOLING

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
LACK OF INCENTIVES	The RES-H&C sector is currently virtually non-existent due to a lack of incentives (tax reliefs, FiT) or even legislation.	
INFALTED BIOMASS	The figures in the NREAP envisage mass usage of biomass which would lead to clear felling and unsustainable forestry practices.	

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
 BIOFUELS QUOTA	With the adoption of the Renewable Energy Act, obligatory blending of liquid oils with biofuels was delayed and will be implemented in phases to halt continuously rising petrol prices.	
 EXCISE RATES	Due to the existing excise rates, there is only one operational biofuel plant. Before the implementation of excise duty, ten bio-diesel and six bio-ethanol plants were operating.	
 LACK OF INCENTIVES	No tax reliefs or subventions to support the development of electro-mobility. Electric vehicles are treated like motor vehicles and are subjected to municipal and vignette taxes.	

Severity: 1 - almost negligible effects, 2 - minor effects, 3 - moderate effects, 4 - substantial effects, 5 - severe effects
Spread: 1 - impacts sporadic installations, 2 - affects a small fraction, 3 - affects a moderate share, 4 - affects a predominant share, 5 - concerns almost all installations

KEY TRENDS IN THE RES SECTOR

- The lack of public acceptance and RES project financing from foreign banks makes the future deployment of renewables in Bulgaria a complicated task not only for producers but also for governments and branch organisations.
- The fixing of feed-in tariffs introduced in 2011 for the whole support period led to the rapid development of some technologies and created significant market failures that now need to be corrected by changes in the RES legislation, policies and incentives.
- The existing support for the RES heating and cooling sector is highly insufficient, consisting of only a couple of grant schemes for installing efficient firewood boilers.
- There is virtually no support for the transport sector as the mixing of biofuels is not widely spread.

POLICY RECOMMENDATIONS

ELECTRICITY SECTOR

- Create and implement predictable, transparent, objective and stable legislative RES framework to alleviate the burden on the end consumer and create a suitable investment environment to nurture new, efficient and cheaper projects.
- Implement a free energy market.
- Draft an energy strategy for smart grids to be incorporated in a 30-year plan for reconstruction and modernisation of the power grids.
- Enforce the “polluter pays” principle.

HEATING AND COOLING

- Increase excise duties on fossil fuels for heating and cooling (“polluter pays” principle).
- Introduce subsidies for wood pellets/chips production etc.
- Issue guarantees of origin for the producers of energy for H&C.
- Require public heat utility companies to have a minimum share of RES heat.

TRANSPORT SECTOR

- Exempt biofuels from excise duties to stimulate the market.
- Create legislation/incentives to promote electro-mobility.
- Exempt automobile taxes/duties, including vignettes.
- Introduce VAT exemptions for the purchasing of a green vehicle.
- Create free parking spaces for electric vehicles.
- Attribute spaces for charging points.
- Reconstruct and modernise rail transport (including electrification).



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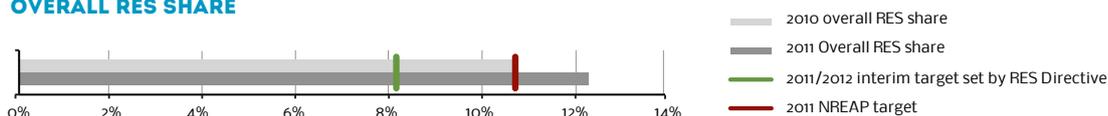
Is Germany ON TRACK?

- Germany has reached its 2011/2012 interim target and the 2011 NREAP target, although the NREAP target for the transport sector was just missed.
- The 2010-2011 growth rates in the electricity and heat sectors increased slightly compared to average growth rates in the previous six years.
- The overall 2010-2011 growth rates are sufficient to achieve the 2020 target, although growth in the transport sector needs to accelerate.

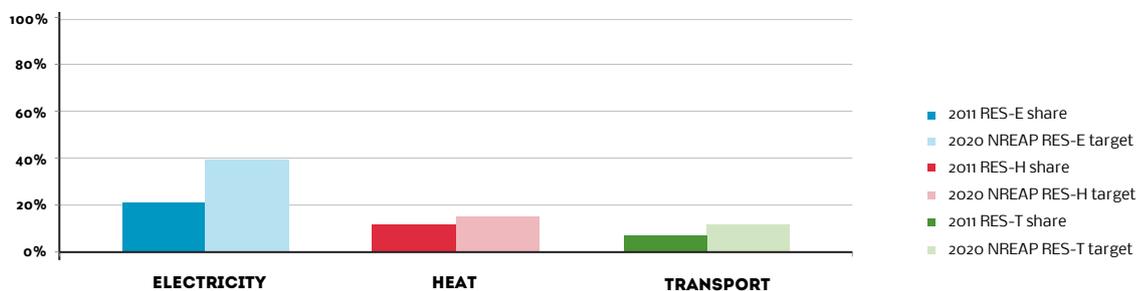
Source: Fraunhofer ISI (based on Eurostat and other sources)

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OVERALL RES SHARE

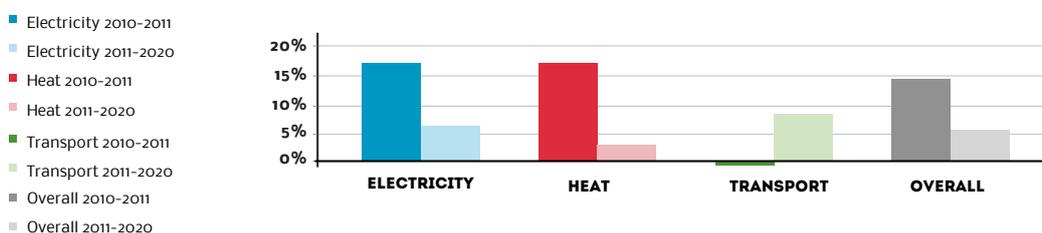


2011 RES SHARE COMPARED TO 2020 TARGET IN SECTORAL GROSS FINAL ENERGY DEMAND



	ELECTRICITY	HEAT	TRANSPORT	TOTAL
2011 actual share of RES in sectoral gross final energy demand	21.3%	12%	6.1%	12.3%
2011 NREAP target	19.3%	9.4%	7.5%	10.8%
2011/2012 interim target set by RES Directive	-	-	-	8.2%
2020 NREAP target	38.6%	15.5%	13.2%	19.6%
Percentage of sector consumption in total final energy consumption in 2011	24%	48%	29%	101%
2011 Production [ktoe]	10.955	12.319	3.180	26.455
2010 Production [ktoe]	9.462	11.572	3.144	24.178
2005 Production [ktoe]	5.293	6.794	0	12.087
2020 NREAP target production [ktoe]	18.653	14.431	6.140	38.557
Deviation [%] of actual from planned share in 2011	10,24%	27,74%	-18,64	13,91%

2010-2011 RES GROWTH RATES VS. AVERAGE ANNUAL GROWTH RATES REQUIRED TO MEET THE 2020 TARGET





BARRIERS to RES deployment

ELECTRICITY

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
HEIGHT AND DISTANCE RESTRICTIONS	Erecting new wind turbines and using available wind energy potential is often impossible due to height/distance restrictions, which differ from state to state (German "Länder").	
GRID EXTENSION	Slow grid reinforcement/extension due to long administrative authorisation processes at every level, motivated by public resistance and practices of grid operators.	
BUILDING RESTRICTION FOR WIND TURBINES	A growing tendency not to allow wind power due to interference with military radars. Seems to only affect the military as big commercial airports have not reported similar problems.	
FINANCING (GEOTHERMAL ENERGY)	Geothermal projects demand high capital investments. Before securing loans, boreholes must be financed.	
TAX REGULATION FOR BIOGAS PLANTS	Interaction between agricultural operations, gas production, and electricity generation are very complex and only feasible with highly skilled tax accountants.	

HEATING AND COOLING

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
UNRELIABLE PUBLIC FUNDING	Discussions about tax relief for retrofitting the building stock and the fear of lack of funding have led to a lack of confidence from consumers and installers. This had a negative impact on choice for RES-H&C and had led to inertia.	
EEWÄRMEG	Poor enforcement of the EEWärmeG (RE Heating Act) affects the development of new installations.	
POLICY INSTRUMENTS FOR THE BUILDING STOCK	Existing policy focuses on new buildings. The Market Incentive Programme for existing buildings has minor positive effects for RES-H&C deployment, is always changing, is not lucrative and has elaborate technical and administrative requirements.	
INFORMATION	Consumers are increasingly insecure and misinformed with regard to the best heating systems available and to future policy regulation (financial incentives offered to the one system or the other).	
FOCUS ON ELECTRICITY MARKET	In connection with the "Energiewende", politics and media focus mainly on the power sector. RES-H&C, with its huge potential for financial and CO ₂ -savings, is widely ignored.	

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
 BIOFUELS TARGET	The biofuel quota will be abolished as of 2015. Use of biofuels will be ensured through a global flat-rate GHG reduction targets. Until 2017, statutory guidelines will bring no growth to the biofuel sector.	
 HAMPERED TRADING IN BIOFUELS	In many German Länder, the RES Directive has not been implemented completely or in a harmonised way, resulting in market distortions.	
 FINANCIAL INCENTIVES FOR PURE BIOFUELS	The preferential tax treatment for pure biodiesel (B100) and vegetable oil fuel ended in January 2013 and that for bioethanol (E85) will come to an end in 2015. Pure biofuels will therefore cease to be financially interesting.	

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KEY TRENDS IN THE RES SECTOR

- Shortly after the 2011 Fukushima nuclear disaster, Germany decided to phase out nuclear energy and accelerate the “Energiewende”, a transformation process of the energy system.
- The Renewable Energy Sources Act (EEG) is the crucial driver for RES growth in the electricity sector. In recent years, the EEG underwent a revision and three amendments. The latest proposed amendments - recently announced by the Environment and Economy Ministers - are ill-considered, overhasty and endanger the success of the “Energiewende”.
- The support policy for the renewable heating and cooling sector is not delivering results. The Government’s evaluation of the Renewable Energy Heat Act (EEWärmeG) - published one year later than expected - falls short of establishing the much-needed changes.
- In the transport sector, the introduction of the E10 fuel in 2011 was a complete failure. Regarding pure biofuels, the preferential tax treatment (insufficient as it was) ended at the beginning of 2013. As for electro-mobility, there are still no relevant incentives for the creation of a market.

POLICY RECOMMENDATIONS

ELECTRICITY SECTOR

- The German RES Association BEE strongly opposes the Ministers’ proposed amendments to the EEG. Amending the law now would only weaken it and endanger the positive development of the electricity sector by triggering a standstill in RES expansion. This would jeopardise progress towards achieving the 2020 targets. The changes necessary for facilitating a system transformation towards renewables should be made in the next regular round of amendments taking place after the federal elections of September 2013.
- BEE supports the establishment of flexibility measures - essential to ensure security of supply - such as grid reinforcement and expansion, load management and storage.

HEATING AND COOLING

- The instable funding provided by the existing market incentive programme fails to spur a significant uptake of RES H&C technologies. BEE recommends the introduction of a reliable support instrument - unaffected by budgetary fluctuations or political whims - to incentivise private investment.

- The current policy framework (EEWärmeG und EnEV) is not challenging enough to induce the use of renewables in new and existing buildings. A comprehensive overhaul is necessary.

TRANSPORT SECTOR

- The replacement of dedicated biofuel blending goals by GHG goals will lead to the stagnation or reduction of biofuel use in transport. There is a need to develop the tax treatment of pure biofuels towards a consistent support policy. The goal of at least 10% market share of RES in transport in 2020 should be maintained. BEE advocates the development of policies for RES-based electro-mobility.



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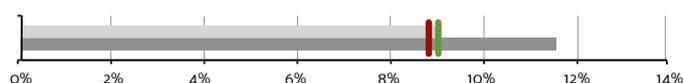
Is Greece ON TRACK?

- Greece has achieved its 2011/2012 interim target and the 2011 NREAP target due to a positive deviation in the heat sector share.
- The overall growth rate in the RES sector from 2010-2011 would be more than high enough to achieve the 2020 target if it could be maintained. This is mainly due to a strong growth trend in the heat sector. The extremely high growth rate in the transport sector may be due to data reporting inconsistencies. Growth in the electricity sector was just slightly too low.

Source: Fraunhofer ISI (based on Eurostat and other sources)

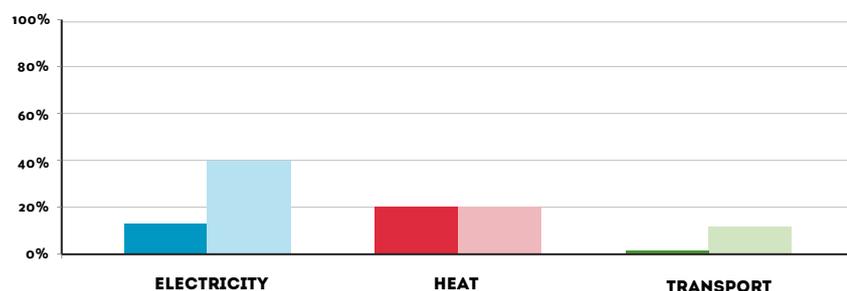
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OVERALL RES SHARE



— 2010 overall RES share
 — 2011 Overall RES share
 — 2011/2012 interim target set by RES Directive
 — 2011 NREAP target

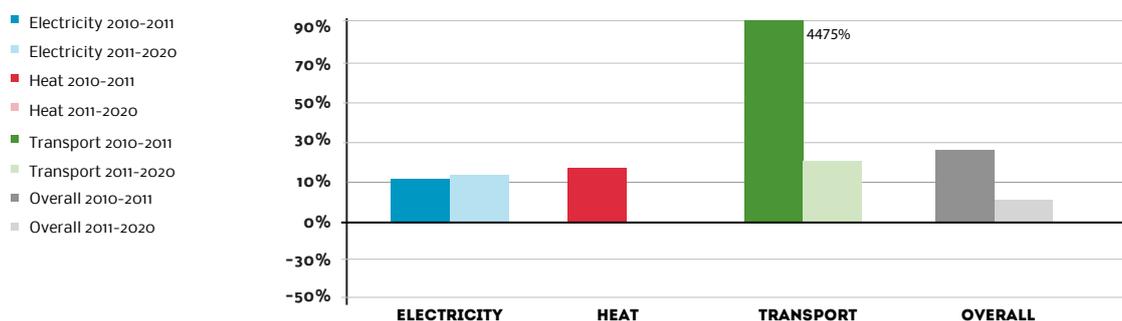
2011 RES SHARE COMPARED TO 2020 TARGET IN SECTORAL GROSS FINAL ENERGY DEMAND



■ 2011 RES-E share
 ■ 2020 NREAP RES-E target
 ■ 2011 RES-H share
 ■ 2020 NREAP RES-H target
 ■ 2011 RES-T share
 ■ 2020 NREAP RES-T target

	ELECTRICITY	HEAT	TRANSPORT	TOTAL
2011 actual share of RES in sectoral gross final energy demand	14.6%	20.1%	1.8%	11.6%
2011 NREAP target	15.7%	15.7%	3.3%	8.8%
2011/2012 interim target set by RES Directive	-	-	-	9.1%
2020 NREAP target	39.8%	19.7%	10.1%	18%
Percentage of sector consumption in total final energy consumption in 2011	27%	33%	39%	100%
2011 Production [ktoe]	781	1.354	108	2.243
2010 Production [ktoe]	709	1.099	130	1.937
2005 Production [ktoe]	551	1.075	0	1.625
2020 NREAP target production [ktoe]	2.345	1.908	634	4.870
Deviation [%] of actual from planned share in 2011	-7.29%	28.11%	-44.40%	31.44%

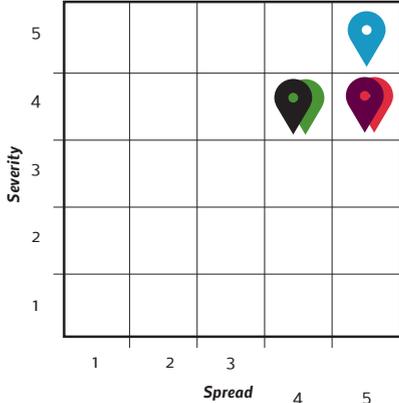
2010-2011 RES GROWTH RATES VS. AVERAGE ANNUAL GROWTH RATES REQUIRED TO MEET THE 2020 TARGET





BARRIERS to RES deployment

ELECTRICITY

BARRIER		
 RETROSPECTIVE LEVY ON THE REVENUES OF RES PROJECTS	<p>The retrospective levy imposed by the Government on the guaranteed gross revenues of all operating RES projects in November 2012 further undermines the credibility of the Greek State, threatens the viability of European RES companies based in Greece and drives away investments. The levy ranges from 10% to 30% depending on RES technology and covers the period from 01.07.2012 to 30.06.2014.</p>	
 UNCERTAINTIES OF FIT	<p>The abrupt reduction of the FiT for PV in Greece adopted in August 2012 along with the existing economic crisis, liquidity problems and the imposition of the levy on the guaranteed gross revenues of RES projects have caused uncertainties concerning the future of the FiT system in Greece.</p>	
 LACK OF LIQUIDITY OF THE ELECTRICITY MARKET OPERATOR	<p>As a result of a rising debt and serious liquidity problems, the Greek Electricity Market Operator has delayed payments to RES producers since the beginning of 2012, making it difficult for them to pay back their loans. This affects the confidence of investors and creditors in the ability of the Greek State to honour its obligations.</p>	
 INSUFFICIENT SUPPORT OF NEW RES PROJECTS	<p>As a result of the rising debt and serious liquidity problems of the Greek Electricity Market Operator and the financial crisis in Greece, financial institutions have shown reluctance to provide financial support to new RES projects. This barrier has existed since the year 2011.</p>	
 INSUFFICIENT INTERCONNECTION NETWORKS	<p>The reinforcement and expansion of the existing grid and the construction of new electrical networks in order to accommodate the NREAP-targeted capacity are required. This is especially the case for the interconnection of the Greek islands with the mainland and for interconnection with other countries.</p>	

Severity: 1 - almost negligible effects, 2 - minor effects, 3 - moderate effects, 4 - substantial effects, 5 - severe effects

Spread: 1 - impacts sporadic installations, 2 - affects a small fraction, 3 - affects a moderate share, 4 - affects a predominant share, 5 - concerns almost all installations

The absence of barrier and policy analysis on the renewable heating and cooling and the transport sector is due to the non-availability of relevant basic data and information updates.

KEY TRENDS IN THE RES SECTOR

- In Greece, the development of commercial RES projects has been associated over the past decade almost exclusively with power production, primarily wind and PV. The implementation of other RES-E technologies accounts for a small fraction of the total national installed RES capacity.
- Newly installed RES capacity has been rapidly increasing in 2011 and 2012, mainly as a result of overcompensation for PV projects. Such growth is not sustainable for the reasons outlined below:
 - a) The burgeoning RES account deficit of the Electricity Market Operator and the increasing lack of liquidity of the electricity market.
 - b) The inability/unwillingness of the national and international investors and creditors to finance energy and RES projects in Greece because of national financial problems.
 - c) The crisis-induced change of attitude of the national Government from a pro-RES to “No More RES” philosophy as documented by a series of recent government decisions namely:
 - The imposition of an indefinite freeze on new PV projects.
 - The imposition of a retrospective levy on the revenues of all operating RES projects.
 - The planned imposition of new financial and administrative barriers to the further development of RES projects outlined in a new draft law for RES.
 - The intention to revise (reduce) the NREAP RES targets for 2020 and the FiT support scheme.
- Currently, RES project developments are frozen except for already licensed and financed RES projects.

POLICY RECOMMENDATIONS

- Immediately suspend the application of the retrospective levy introduced by the Government in November 2012 on the guaranteed gross revenues of all operating RES-E projects in Greece, at least for wind, small hydro and biomass.
- Come up with alternative, constructive solutions to reduce the RES account deficit and protect the viability of the national RES market.
- Cancel planned requirements for the issuance of expensive bank guarantees put in place to retain existing RES grid connection commitments by the TSO or to obtain new ones.
- Cancel the planned requirement for bank guarantees to retain RES generation licenses and other administrative measures contained in the new draft law for RES which raise obstacles to the development of RES projects.
- Invite representatives of independent RES power producers to join the Committee that the Energy Ministry has formed to

propose RES target revisions for 2020 and modifications of the RES support system to the Troika (European Commission, International Monetary Fund, European Central Bank).

- As many EU countries are facing similar problems, formulate common solutions at a European level.



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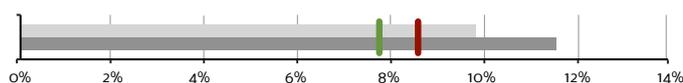
Is Italy ON TRACK?

- Italy has met its 2011/2012 interim target and the 2011 NREAP target with an overall increase in RES production of 16.7% from 2010 to 2011.
- The 2010-2011 growth rate in the electricity sector almost doubled compared to the prior six year average while growth in the heat sector remained at a consistently high level.
- With the growth rates of 2010-2011, 2020 targets will be achieved in the renewable electricity and heat sectors while renewable transport production needs to grow faster.

Source: Fraunhofer ISI (based on Eurostat and other sources)

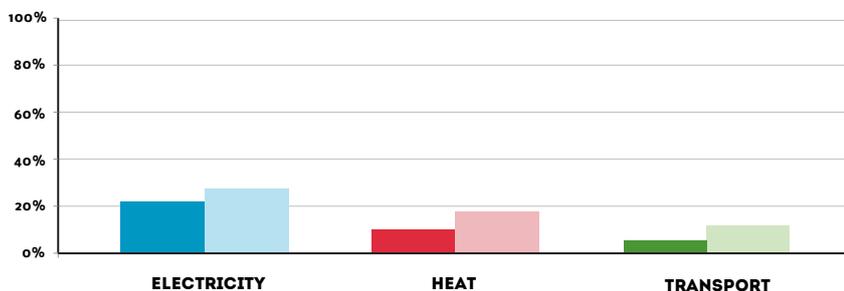
To access more detailed information on the deviations of each EU Member State from its indicative trajectory, please visit the Keep on Track! website - www.keepontrack.eu - and read the Analysis of Deviations and Barriers Report.

OVERALL RES SHARE



- 2010 overall RES share
- 2011 Overall RES share
- 2011/2012 interim target set by RES Directive
- 2011 NREAP target

2011 RES SHARE COMPARED TO 2020 TARGET IN SECTORAL GROSS FINAL ENERGY DEMAND

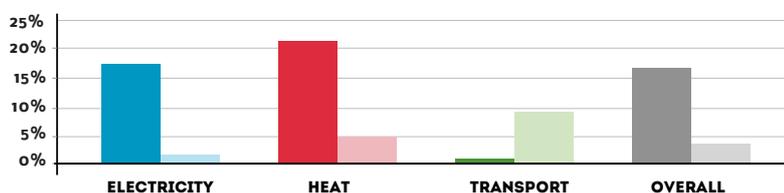


- 2011 RES-E share
- 2020 NREAP RES-E target
- 2011 RES-H share
- 2020 NREAP RES-H target
- 2011 RES-T share
- 2020 NREAP RES-T target

	ELECTRICITY	HEAT	TRANSPORT	TOTAL
2011 actual share of RES in sectoral gross final energy demand	23.5%	11%	4.7%	11.5%
2011 NREAP target	19.6%	7.1%	4.1%	8.7%
2011/2012 interim target set by RES Directive	-	-	-	7.6%
2020 NREAP target	26.4%	17.1%	10.1%	17%
Percentage of sector consumption in total final energy consumption in 2011	24%	44%	33%	101%
2011 Production [ktoe]	7.013	6.070	1.641	14.724
2010 Production [ktoe]	5.924	5.257	1.643	12.824
2005 Production [ktoe]	4.166	1.966	0	6.132
2020 NREAP target production [ktoe]	8.504	10.456	2.530	21.490
Deviation [%] of actual from planned share in 2011	20.32%	54.69%	13.46%	32.64%

2010-2011 RES GROWTH RATES VS. AVERAGE ANNUAL GROWTH RATES REQUIRED TO MEET THE 2020 TARGET

- Electricity 2010-2011
- Electricity 2011-2020
- Heat 2010-2011
- Heat 2011-2020
- Transport 2010-2011
- Transport 2011-2020
- Overall 2010-2011
- Overall 2011-2020





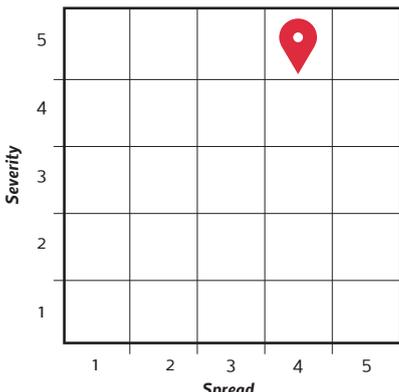
BARRIERS to RES deployment

ELECTRICITY

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
INCENTIVE SYSTEM	<p>The support system for RES has been continuously modified, leading to uncertainty for RES producers as to which type of tariff they will obtain. The new support scheme of 2013 does not ensure financial support for existing plants.</p>	
ACCESS TO FINANCE	<p>The modifications of incentive schemes create continuous uncertainties about the access to incentives. Banks are reluctant to grant loans without financial guarantees.</p>	
AUTHORISATION PROCEDURES	<p>Complexity of authorisation procedure (unclear provisions, different interpretations of the law etc.) does not allow for planning the timing and investment costs for RES installations.</p>	
GRID CONNECTION	<p>Time consuming connection procedures, lack of stability of regulatory framework and frequent changes to laws that are not clear and fair caused many issues for grid access.</p>	
GRID INFRASTRUCTURE	<p>The electricity grid is not sufficiently developed. Wind energy cannot be exploited because of lacking grid infrastructure, particularly in the South.</p>	

HEATING AND COOLING

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
INFORMATION	<p>The insufficient knowledge of solutions related to RES-H&C affects the initial decision process, the granting of permits, the request for incentives and funding.</p>	
QUALIFICATION OF INSTALLERS	<p>Installers are often insufficiently qualified for RES installations. As a result, installations can be wrongly installed and incentives are often not allocated.</p>	
SUPPLY CHAIN	<p>There is no comprehensive strategy for biomass supply. This would include land management, production, controls, transport, transformation and waste management.</p>	
INCONSISTENT LEGISLATION	<p>Legislation is often characterised by the lack of implementation of primary measures and by the inconsistency between different regulations and provisions.</p>	
COMPLEXITY OF THE LEGAL FRAMEWORK	<p>The legal framework is a complex mix of measures arising from diverse laws and is lacking a holistic approach. The unclear and unstable norms often lack common references so that rules differ from region to region.</p>	

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
 INFORMATION	Insufficient knowledge, lack of information and the lack of industry experts are the major obstacles for the development of RES-T. This impacts the entire process from the initial decision process to the identification of suitable support schemes.	

Severity: 1 - almost negligible effects, 2 - minor effects, 3 - moderate effects, 4 - substantial effects, 5 - severe effects
Spread: 1 - impacts sporadic installations, 2 - affects a small fraction, 3 - affects a moderate share, 4 - affects a predominant share, 5 - concerns almost all installations

KEY TRENDS IN THE RES SECTOR

Measures adopted in 2012 mainly aimed at reducing the costs of RES production. Cuts affected incentive schemes, the network regulation, dispatching rules etc. This new policy strongly penalises the renewable energy industry as cuts were not balanced with a reduction of inefficiencies affecting the Italian RES industry.

Since October 2012, a draft National Energy Strategy has been under public consultation. Its priority is the sustainable development of RES. However, the document does not provide tools to achieve this. Continuous changes to the

incentive system have caused uncertainty among operators, in particular the new mechanisms adopted (which reduced incentives and introduced a cap on capacity)¹¹.

There is no proper incentive for RES H&C. Incentives are often related to energy efficiency and are temporary. The *Conto Energia Termico* was finally adopted in December 2012 and introduced an incentive for the heat sector similar to *Conto Energia* for PV, but the decree focuses almost exclusively on small plants.

POLICY RECOMMENDATIONS



ELECTRICITY SECTOR

- Simplify procedures and apply rules homogeneously across regions/provinces.
- Respect timing and procedures stated by the law: complex authorisation processes do not enable producers to plan the timing and investment costs.
- Guarantee clear and stable incentives over time and most importantly do not introduce retrospective changes. The continuous introduction and modification of incentives do not give operators the necessary guarantees about the incentives due.
- Provide clear measures for an unambiguous interpretation. The lack of clear procedures, the different rules for interpretation used by local agencies and the absence of experts on RES cause incoherence on the taxation of energy products.



HEATING AND COOLING

- Ensure support as a priority, or an additional premium, to high efficiency cogeneration biomass.
- Provide a price structure promoting heat pumps without asking for additional connection points.



TRANSPORT SECTOR

- Promote biomass in the heat sector in an integrated approach to create local offer and balance supply and demand.
- Structure incentive programs to develop a robust supply chain.
- Implement a regulatory framework to develop sustainable transport systems. The insufficient knowledge, lack of information and of industry experts are major obstacles to the developments of RES in transport.



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¹¹ V *Conto Energia* - DM 5/7/2012- on PV sector and DM FER elettriche - DM 6/7/2012- on other RES.



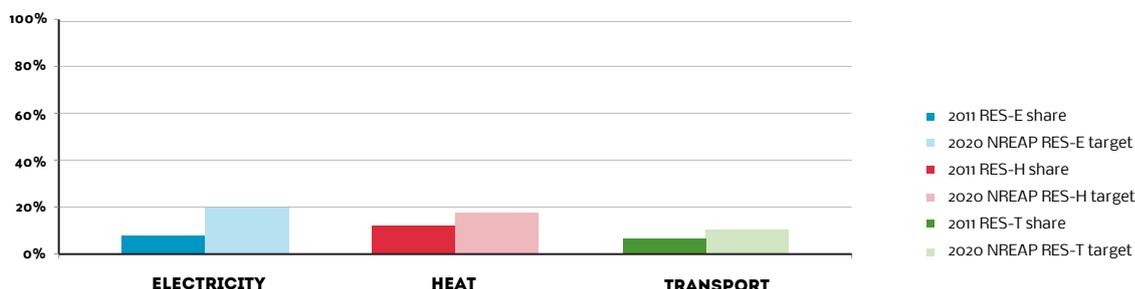
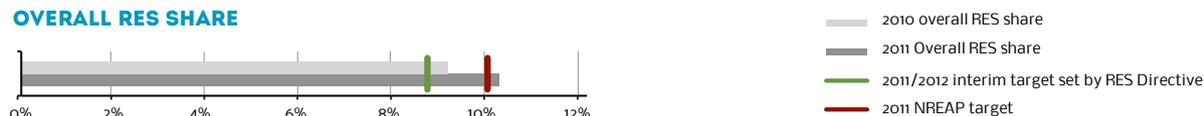
Is Poland ON TRACK?

- Poland has complied with its 2011/2012 interim target and the 2011 NREAP target although the target for the electricity sector was just missed.
- 2010-2011 growth rates were higher than the prior six year average. The electricity sector share experienced the highest growth rate.
- Regarding the 2010-2011 growth rates, the only sector with an insufficient growth rate is the transport sector. The overall 2020 target would be achieved with the current overall growth rate.

Source: Fraunhofer ISI (based on Eurostat and other sources)

To access more detailed information on the deviations of each EU Member State from its indicative trajectory, please visit the Keep on Track! website - www.keepontrack.eu - and read the Analysis of Deviations and Barriers Report.

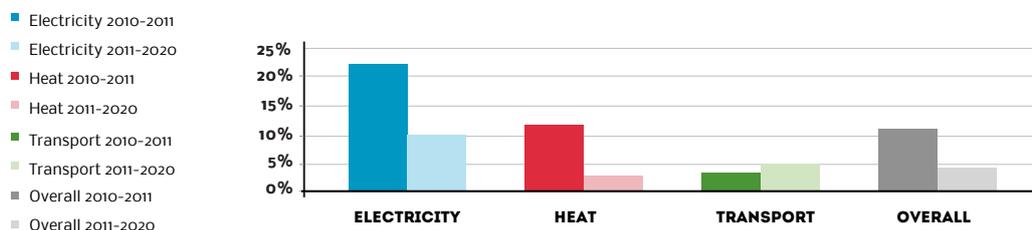
OVERALL RES SHARE



2011 RES SHARE COMPARED TO 2020 TARGET IN SECTORAL GROSS FINAL ENERGY DEMAND

	ELECTRICITY	HEAT	TRANSPORT	TOTAL
2011 actual share of RES in sectoral gross final energy demand	8.2%	13.3%	6.5%	10.4%
2011 NREAP target	8.9%	12.5%	6.3%	10.4%
2011/2012 interim target set by RES Directive	-	-	-	8.8%
2020 NREAP target	19.1%	17.1%	10.1%	15.5%
Percentage of sector consumption in total final energy consumption in 2011	20%	55%	26%	101%
2011 Production [ktoe]	1.110	4.905	950	6.966
2010 Production [ktoe]	894	4.637	899	6.429
2005 Production [ktoe]	331	3.865	0	4.196
2020 NREAP target production [ktoe]	2.786	5.921	2.018	10.725
Deviation [%] of actual from planned share in 2011	-7.60%	6.20%	3.24%	3.02%

2010-2011 RES GROWTH RATES VS. AVERAGE ANNUAL GROWTH RATES REQUIRED TO MEET THE 2020 TARGET





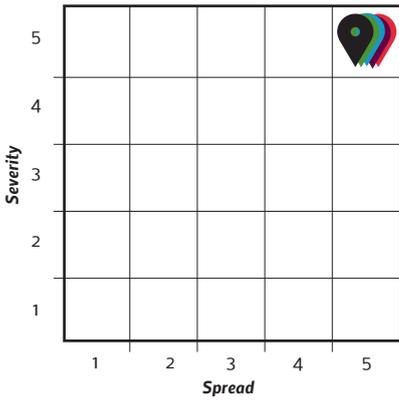
BARRIERS to RES deployment

ELECTRICITY

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
UNSTABLE SUPPORT SYSTEM	Green certificate prices fell by over 60% due to oversupply, causing a breakdown of new investments in RES and serious difficulties for existing projects. The draft Act on RES does not provide a stable support system.	
INVESTMENT GRANTS	Resources allocation under European funds led to a high share of subsidies in the total investment cost of projects. As a result of the limited funds available, the competitiveness of RES market is affected.	
GRID ACCESS	Poor infrastructure in the distribution and transmission grids. No priority and guaranteed connection to the grid. Closed access to electricity grid.	
SPATIAL DEVELOPMENT PLANS	Most Polish municipalities lack spatial development plans. Even if provided, the plans do not foresee RES plants in the area. Building permits are issued on the basis of planning permissions or a new local spatial development plan needs to be approved, which is costly and time consuming.	
MYTHS	The Government is determined to develop conventional power plants, resulting in propaganda against RES-E. Arguments used are higher energy prices for end users, deterioration of the landscape and a negative impact on the stability of the grid.	

HEATING AND COOLING

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
LIMITED ACCESS TO BIOMASS	A major part of electricity generated in Poland is produced from biomass, which limits the availability of solid biomass at a reasonable price for the heating sector.	
SUPPORT SYSTEM IN CO-GENERATION	The support for CHP through the allocation of certificates is not stable. The red and yellow certificates have been moved away from the support schemes. The minimum price of the violet certificate (only for CHP biogas based installations) is not guaranteed and the maximum price is too low to incentivise RES installations from biomass, including biogas.	
FISCAL INCENTIVES	There are no fiscal mechanisms to incentivise citizens to equip their residential buildings with thermal energy installations such as heat pumps, solar panels, or biomass boilers.	
RES-H&C AWARENESS CAMPAIGN	There is no professional education and information campaign to promote the use of energy from RES.	

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
 BIOFUELS QUOTA	The biofuels quota depends on technological advancement in the automobile industry which closely cooperates with the refining sector and is not interested in using biofuels on a larger scale.	
 DIESELISATION OF TRANSPORT	The preferential rates of excise duty for diesel oil and the dynamic progress of compression ignition engines have led to a clear dominance of methyl esters over bioethanol.	
 TECHNOLOGICAL LIMITATIONS	Use of Common Rail fuel injection in compression ignition engines has limited the possible use of methyl esters as a bio-component of diesel oil.	
 BIOFUEL MANUFACTURING COSTS	Many factors affect the prices of agricultural raw materials, which directly influence the price of biofuels. Biofuel production from non-food and waste is still too expensive.	
 "B100 CAROUSEL"	Economic issues relating to the sale of B100 (high production costs, artificially low B100 in order to make it more attractive) has led to multi-trading of B100.	

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Spread: 1 - impacts sporadic installations, 2 - affects a small fraction, 3 - affects a moderate share, 4 - affects a predominant share, 5 - concerns almost all installations

KEY TRENDS IN THE RES SECTOR

- For over a year, the Polish Government has been trying to transpose the RES Directive into national law. The Government presented several versions of the draft Act on RES, which caused uncertainty among entrepreneurs. The publication of the first draft in December 2011 led banks to stop providing funds for investment projects.
- The prices of green certificates have collapsed as a result of surplus of certificates in the market compared to the size of the obligations set for RES-E.
- Furthermore, electricity market prices have significantly decreased.

POLICY RECOMMENDATIONS



ELECTRICITY SECTOR

These recommendations should be included in the final RES Act:

- Introduce a minimum purchase price for green certificates representing at least 90% of the unit substitute fee, excluding long-term contracts if the purchase values and the valorisation mechanism can be determined in a more flexible manner.
- Define, in the ordinance, the obligation for years leading up to 2020 according to the minimum amounts determined in the Polish NREAP.
- Limit support to energy produced from old, large and amortised hydro plants, large biomass based power plants.
- Introduce the compulsory certification of biomass.
- Introduce guaranteed access to the grid.
- Take RES into account in spatial planning.



HEATING AND COOLING

- Introduce tax exemptions for the purchase of solar collectors, heat pumps, biomass boilers in buildings.
- Extend the use of certificates in the Energy Law Act until 2030.



TRANSPORT SECTOR

- Set a minimum purchase price for certificates from co-generation ensuring profitable investments into CHP using biomass/biogas/bioliquids.
- End subsidies to oil-based fuels and improve technologically the engines used in transport.
- Change the taxation of energy products, where the level of charging will depend on emissions and the nature of the energy carrier (renewable/non-renewable).



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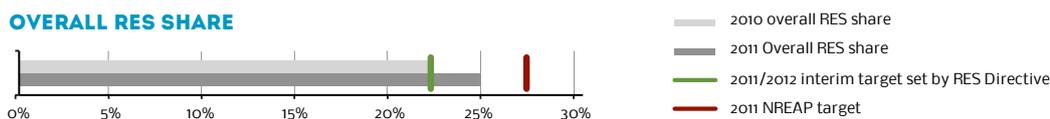
Is Portugal ON TRACK?

- Portugal published a new NREAP in April 2013. Due to a lower overall energy demand, the new NREAP foresees higher RES shares than the original version.
- The 2011/2012 interim target was achieved, but the NREAP target for 2011 was missed.
- Overall growth from 2010 to 2011 has increased compared to the prior six year average.
- The growth rates of 2010-2011 would be sufficient to achieve the overall 2020 target if they can be maintained.

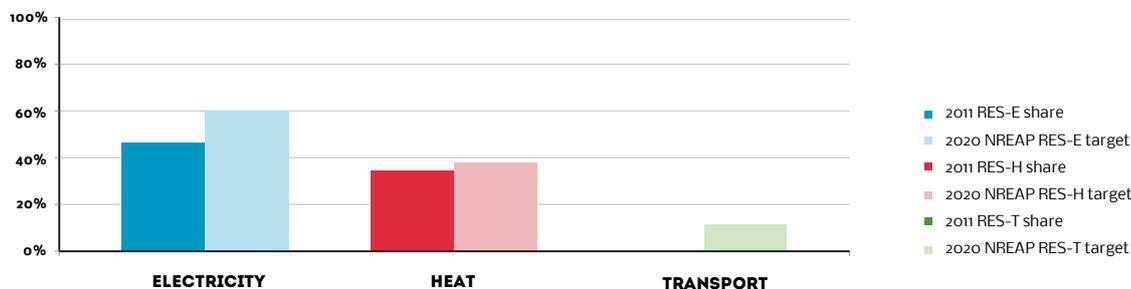
Source: Fraunhofer ISI (based on Eurostat and other sources)

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OVERALL RES SHARE

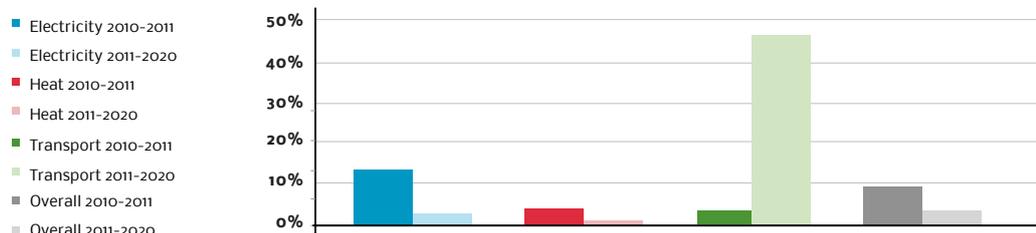


2011 RES SHARE COMPARED TO 2020 TARGET IN SECTORAL GROSS FINAL ENERGY DEMAND



	ELECTRICITY	HEAT	TRANSPORT	TOTAL
2011 actual share of RES in sectoral gross final energy demand	46.5%	35.5%	0.4%	24.9%
2011 NREAP target	45.2%	34.7%	5.6%	27.3%
2011/2012 interim target set by RES Directive	-	-	-	22.6%
2020 NREAP target	59.6%	35.9%	11.3%	34.5%
Percentage of sector consumption in total final energy consumption in 2011	26%	35%	39%	100%
2011 Production [ktoe]	2.188	2.227	21	4.436
2010 Production [ktoe]	1.995	2.219	22	4.237
2005 Production [ktoe]	710	2.536	0	3.247
2020 NREAP target production [ktoe]	2.777	2.431	579	5.737
Deviation [%] of actual from planned share in 2011	2.91%	2.18%	-93.33%	-8.96%

2010-2011 RES GROWTH RATES VS. AVERAGE ANNUAL GROWTH RATES REQUIRED TO MEET THE 2020 TARGET





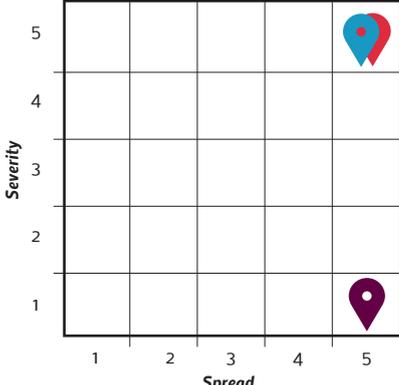
BARRIERS to RES deployment

ELECTRICITY

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
FINANCING	It is difficult to obtain financing from the markets due to the financial crisis and the capital intensity of RES projects. Regulatory instability is also hampering the attraction of foreign investors' interest.	
COMPATIBILITY WITH LAND-USE MANAGEMENT INSTRUMENTS	Compatibility of RES-E projects with Municipal Master Plans and forest areas is not foreseen. Building in certain areas is prohibited. Licensing processes are long and complex, involving entities that are not coordinated. Promoters are subject to bargaining.	
ENVIRONMENTAL LICENSING	Almost all RES projects require lengthy and expensive environmental studies that have negative impacts on projects. The procedures of the Environmental Impact Assessment Committees can also impact negatively on projects.	
INSTALLING ADDITIONAL CAPACITY ONSHORE WIND	Installing additional power capacity to increase production when the wind resource is low is currently impossible due to banks' tougher financing conditions as well as the lack of a simplified licensing regime.	
FISCAL ISSUES	Fiscal authorities attempt to get income from installing additional power capacity in existing wind farms to increase production when the wind resource is low is currently impossible, charging unreasonable Municipal Real Estate taxes and suggesting very high amortisation periods (25 years).	

HEATING AND COOLING

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
INFORMATION ON RES-H&C	Lack of awareness about RES-H&C technologies and its benefits by policy makers, general public, urban planners and installers results in resistance to these technologies.	
SUPPORT MECHANISMS	Absence of support mechanisms for RES-H&C. Stop-and-go policies - no long term strategy.	
CERTIFICATION SCHEMES	No certification schemes for installers and equipment.	
UNDEVELOPED NATIONAL MARKET	Lack of national industrial production of equipment for pellet stoves and boilers (most of them are imported). Market statistics are unreliable.	
BIOMASS FUEL QUALITY	There is no certification system or quality controls with which to check biomass fuel quality.	

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
 DOMESTIC PRODUCTION PROTECTION REGIME	Rules protecting the national market oblige blenders to source a minimum of biodiesel domestically, which hinders the import of biofuels other than biodiesel. The limited allocation of quotas makes it difficult for new investors to enter the biodiesel market.	
 PRICING OF BIODIESEL	The pricing of biodiesel produced in Portugal based on the volatile international quotations of this product fails to ensure the necessary profit margins for the industry and sustain businesses in the long-term.	
 SUPPORT FOR ELECTRO MOBILITY	Economic constraints along with a change in the government have resulted into the withdrawal of the government's support for the electro-mobility program Mobi.E.	

Severity: 1 - almost negligible effects, 2 - minor effects, 3 - moderate effects, 4 - substantial effects, 5 - severe effects

Spread: 1 - impacts sporadic installations, 2 - affects a small fraction, 3 - affects a moderate share, 4 - affects a predominant share, 5 - concerns almost all installations

KEY TRENDS IN THE RES SECTOR

• The framework of RES developments in Portugal has significantly changed since 2010, due to new political and economical cycles. In the latest months several legislative updates have taken place, such as the finalization

of negotiations with the government regarding wind support schemes publication of legislation setting up a new framework of the electricity system, along with the publication of the downward revised version of the NREAP.

POLICY RECOMMENDATIONS



ELECTRICITY SECTOR

- Predictable government aid providing access to funding.
- Overcome administrative barriers by implementing the one-stop shop, ensuring RES projects are compatible with forest or burnt areas and lessening environmental licensing processes.
- Conduct an independent study informing the public on the real costs of electricity production technologies.
- Review all existing FIT.
- Smooth the process for overpowering installation.
- Legislate for a special expropriation regime for the construction of aerial lines.
- Remove fiscal barriers to wind-farms promoters and micro generators.
- Implement a program to increase sustainable biomass production.



HEATING AND COOLING

- Recast the communication campaign “Água Quente Solar”¹² covering all RES-H&C technologies.
- Call for an increase in RES-H&C targets, guaranteeing at least that historical shares are kept. Recover fiscal benefits for RES-H&C equipments and VAT reduction.
- Make biomass equipment eligible for the EE Fund.
- Promote studies to assess the viability of implementing RES-DH projects in Portugal.
- Set up legislation to oblige the certification of installers and equipments.



TRANSPORT SECTOR

- Set up a mandatory quality control scheme for biomass products in the market for non-industrial use.
- Set up incentives to promote a national market of biomass equipments.
- Public R&D investment to study geothermal resources.
- Increase the amount of the biodiesel production quota provided to biodiesel producers.
- Provide incentives to invest in innovative technologies and raw materials.
- Differentiate sustainable biofuels based on their carbon footprint.
- Assess the potential for incorporating bio-substitutes of gasoline without dedicated incentives.
- Promote electro-mobility by restoring financial and fiscal incentives. Commend their use in government fleet and public transportation. Restore the Mobi.E network, and promote equipment and systems normalisation.



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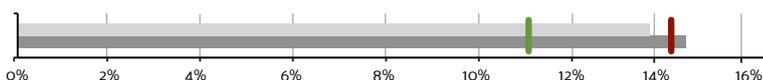
Is Spain ON TRACK?

- Spain has complied with its 2011/2012 interim target and the 2011 NREAP target. Spain's revised NREAP published in 2011 sets the 2020 overall target share at 20.8%, lower than the original NREAP's target of 22.7%, but still higher than the binding minimum of 20% set in the Directive.
- Compared to the average of the previous six years, growth between 2010 and 2011 slowed down in the electricity sector.
- 2010-2011 growth rates are more than twice what would be necessary to achieve the 2020 target if they were to be maintained.

Source: Fraunhofer ISI (based on Eurostat and other sources)

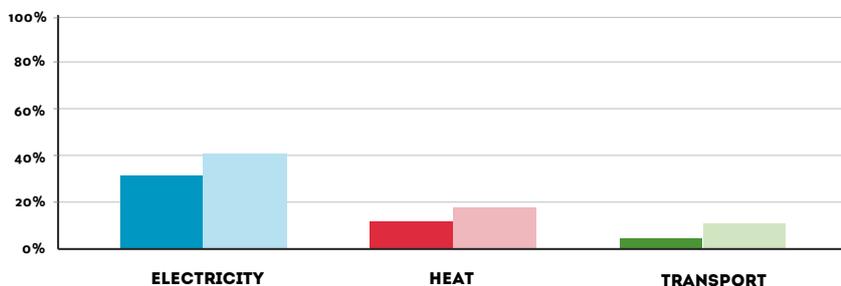
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OVERALL RES SHARE



— 2010 overall RES share
 — 2011 Overall RES share
 — 2011/2012 interim target set by RES Directive
 — 2011 NREAP target

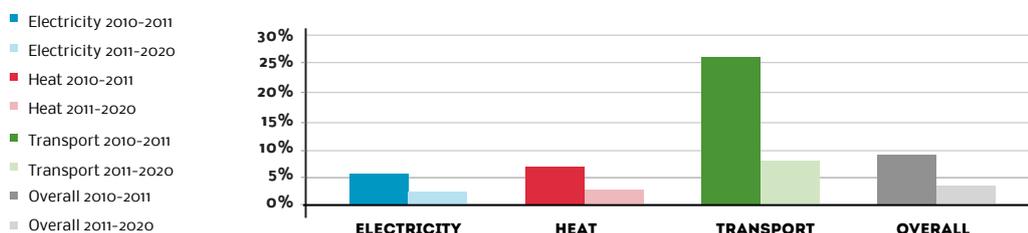
2011 RES SHARE COMPARED TO 2020 TARGET IN SECTORAL GROSS FINAL ENERGY DEMAND



■ 2011 RES-E share
 ■ 2020 NREAP RES-E target
 ■ 2011 RES-H share
 ■ 2020 NREAP RES-H target
 ■ 2011 RES-T share
 ■ 2020 NREAP RES-T target

	ELECTRICITY	HEAT	TRANSPORT	TOTAL
2011 actual share of RES in sectoral gross final energy demand	31.5%	13.5%	5.9%	15.1%
2011 NREAP target	31%	11.3%	7.1%	14.4%
2011/2012 interim target set by RES Directive	-	-	-	11%
2020 NREAP target	39%	17.3%	11.3%	20.8%
Percentage of sector consumption in total final energy consumption in 2011	27%	33%	40%	100%
2011 Production [ktoe]	7.674	4.053	1.767	13.493
2010 Production [ktoe]	7.422	3.904	1.477	12.804
2005 Production [ktoe]	3.634	3.533	0	7.167
2020 NREAP target production [ktoe]	12.455	5.357	3.216	20.525
Deviation [%] of actual from planned share in 2011	1.61%	19.59%	-16.33%	4.63%

2010-2011 RES GROWTH RATES VS. AVERAGE ANNUAL GROWTH RATES REQUIRED TO MEET THE 2020 TARGET

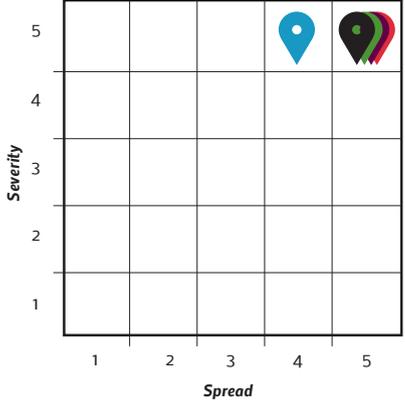


■ Electricity 2010-2011
 ■ Electricity 2011-2020
 ■ Heat 2010-2011
 ■ Heat 2011-2020
 ■ Transport 2010-2011
 ■ Transport 2011-2020
 ■ Overall 2010-2011
 ■ Overall 2011-2020

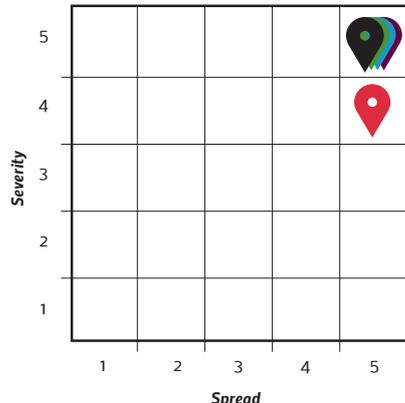


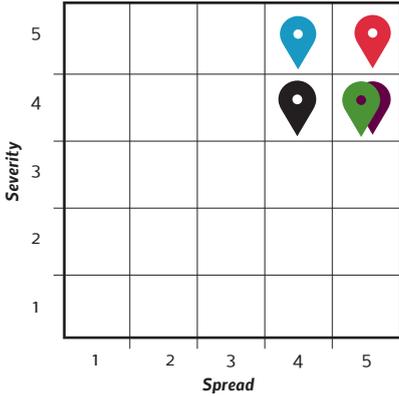
BARRIERS to RES deployment

ELECTRICITY

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
 MORATORIUM ON RES-E INSTALLATIONS	In January 2012, FIT pre-allocation procedures were suspended and economic incentives for new capacities involving CHP, all kinds of RES and waste were removed.	
 NEW LAW ON FISCAL MEASURES	The Law on fiscal measures enacted in 2013 foresees a new retrospective tax of 7% on the sale of electricity for conventional and RES technologies for both new and existing installations.	
 RETROSPECTIVE MEASURES	At the end of 2010, several retrospective remuneration cuts were introduced: change of bonus-malus system for retrospective power, reduction of the remuneration period for PV, annual limitation of production hours for wind, CSP and PV.	
 TARIFF DEFICIT	The tariff deficit first appeared in 2002 and has continued growing ever since. The tariff deficit ultimately provoked both the RES moratorium and new retrospective fiscal measures.	
 OVERCAPACITIES	Huge overcapacity in the electricity market is an overarching barrier with consequences similar to the tariff deficit.	

HEATING AND COOLING

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
 LACKING SUPPORT FOR BIOMASS	Biomass heat in Spain remains far behind its potential, strongly failing quantitative biomass goals.	
 FUNCTIONING OF SUPPORT SCHEMES	Most applications for grants can only be submitted in a short period of time once a year (often only 4 weeks) and the submission dates differ in each region.	
 NO PRODUCTION BASED INSTRUMENT FOR RES-H&C	The planned RES-H&C incentive ICAREN was not introduced in 2011. The new Government does not seem interested in introducing ICAREN or something comparable anymore.	
 DEMAND FOR RES-H&C INSTALLATIONS	Due to the crisis in the housing sector, the number of new buildings annually constructed dropped from 615,000 in 2008 to just around 150,000 in 2011. This has had an impact on the number of new solar thermal installations.	
 TECHNICAL BUILDING CODE	Main barriers: lack of control of compliance for specific RES installations with the minimum standards, lack of an obligation to install solar thermal energy metres, lack of certification control of the solar thermal installation.	

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
 DISLOYAL COMMERCIAL PRACTICES	Massive imports of biodiesel originating in Argentina and Indonesia are flooding the Spanish market, negatively affecting the Spanish biodiesel industry.	
 BIOETHANOL BLENDING RESTRICTIONS	Obligation that all petrol stations offer “protection grade petrol” undermines development and consumption of E10.	
 TAX INCENTIVE FOR BIOFUELS	Tax incentives for biofuels were abolished in 2012. Therefore, the price of fuels containing biofuels has increased, especially B30, B100, E85, affecting their consumption.	
 LACK OF WAIVER IN THE PETROL VAPOUR PRESSURE	Lack of authorisation by the EC hinders direct blends of petrol with bioethanol in the summer period in Spain, leading to a decrease in bioethanol consumption.	
 REGULATION ON DOUBLE COUNTING BIOFUELS	Biofuels from non-agricultural sources shall be produced twice as much as regular biofuels. This EU provision was transposed into Spanish legislation but not implemented.	

Severity: 1 - almost negligible effects, 2 - minor effects, 3 - moderate effects, 4 - substantial effects, 5 - severe effects

Spread: 1 - impacts sporadic installations, 2 - affects a small fraction, 3 - affects a moderate share, 4 - affects a predominant share, 5 - concerns almost all installations

KEY TRENDS IN THE RES SECTOR

- Due to the economic crisis, electricity demand dropped to 2006 levels, thereby increasing overcapacity in the Spanish electricity market. This led to strong competition between RES electricity producers and gas-fired combined cycle plants.
- Another consequence of the crisis in Spain is the re-financing of the tariff deficit (currently about €28 billion) which the Government used to justify retrospective cuts and freeze RES-E support. This clearly endangers the fulfilment of the 2020 RES goals of Spain.
- Recent changes to RES-E support challenged investment security in Spain, leading to the bankruptcy of thousands of small RES-E projects. Since January 2012, a moratorium is in place for all new RES-E installations. In February 2013, the Spanish Government approved a Royal Decree-Law which retrospectively abolished one of the two remuneration options of the Spanish RES-E support scheme based on Royal Decree 661/2007 (enabling a producer to receive the hourly

wholesale electricity market price plus a green premium). It removed the indexation of RES-E remuneration to inflation making the existing feed-in tariff a degressive one. In January 2013, a new law established a tax, with a flat rate of 7%, on electricity sales applying to new and existing installations. In 2010, retrospective measures were introduced mainly for PV, leading to revenue losses and law suits against Spain.

- Support for RES-H&C is characterised by too low promotion levels/volumes or even the complete lack of finance, training, qualification and specialisation measures (regarding new installation and control of its correct functioning).
- The Spanish biodiesel industry is confronted since 2008 with unfair commercial practices from Argentina and Indonesia. Furthermore, the Spanish bioethanol industry is confronted with blending restrictions undermining the development of higher blends such as E10.

POLICY RECOMMENDATIONS

ELECTRICITY SECTOR

- Remove, as soon as possible, the RES-E moratorium.
- Only apply the planned 7% tax on electricity sales to the earnings achieved through the market price, but not above this level. The tax should apply also to other payments for conventional power sources e.g. adjustment services, capacity payments. Additionally, a higher tax for nuclear waste and storage should be introduced.
- Abolish as soon as possible the 2010 retrospective legal package.

HEATING AND COOLING

- Adopt a RES Heat Incentive (ICAREN) or a similar operation based RES-H&C support instrument.

TRANSPORT SECTOR

- Adopt regulations preventing Argentina and Indonesia from introducing unfair practices.
- Allow the introduction of E10 on the Spanish market and maintain tax incentives for biofuels.



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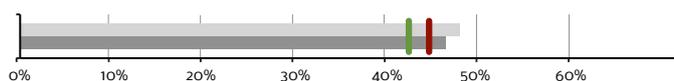
Is Sweden ON TRACK?

- Sweden is well on track, even though its RES share has decreased slightly since last year. It achieved both its 2011/2012 interim target and the 2011 NREAP target.
- The overall RES growth slowed down from 2010 to 2011 compared to the prior six year average due to a deceleration in the heat sector.
- The overall negative growth rate needs to be reversed, but preliminary statistics for 2012 show that this is being achieved.

Source: Fraunhofer ISI (based on Eurostat and other sources)

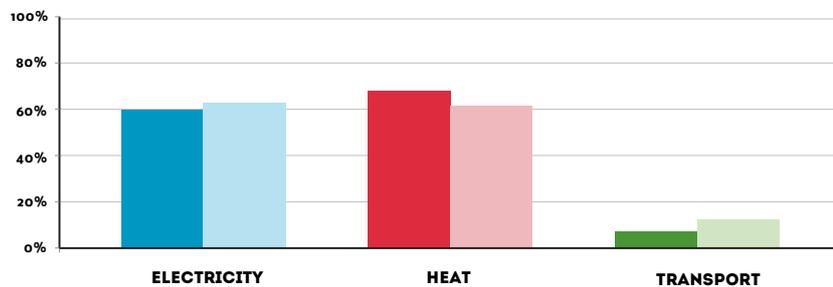
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OVERALL RES SHARE



— 2010 overall RES share
 — 2011 Overall RES share
 — 2011/2012 interim target set by RES Directive
 — 2011 NREAP target

2011 RES SHARE COMPARED TO 2020 TARGET IN SECTORAL GROSS FINAL ENERGY DEMAND

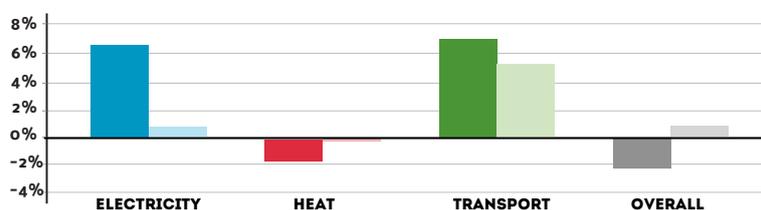


■ 2011 RES-E share
 ■ 2020 NREAP RES-E target
 ■ 2011 RES-H share
 ■ 2020 NREAP RES-H target
 ■ 2011 RES-T share
 ■ 2020 NREAP RES-T target

	ELECTRICITY	HEAT	TRANSPORT	TOTAL
2011 actual share of RES in sectoral gross final energy demand	59.6%	64.5%	8.8%	46.8%
2011 NREAP target	55.7%	57.6%	8.1%	44.2%
2011/2012 interim target set by RES Directive	-	-	-	41.6%
2020 NREAP target	62.9%	62.1%	13.8%	50.2%
Percentage of sector consumption in total final energy consumption in 2011	37%	36%	26%	99%
2011 Production [ktoe]	7.331	8.196	550	16.077
2010 Production [ktoe]	7.247	9.878	491	17.615
2005 Production [ktoe]	6.980	7.608	0	14.588
2020 NREAP target production [ktoe]	8.356	10.543	1.008	19.709
Deviation [%] of actual from planned share in 2011	7.03%	12.04%	8.64%	5.83%

2010-2011 RES GROWTH RATES VS. AVERAGE ANNUAL GROWTH RATES REQUIRED TO MEET THE 2020 TARGET

■ Electricity 2010-2011
 ■ Electricity 2011-2020
 ■ Heat 2010-2011
 ■ Heat 2011-2020
 ■ Transport 2010-2011
 ■ Transport 2011-2020
 ■ Overall 2010-2011
 ■ Overall 2011-2020





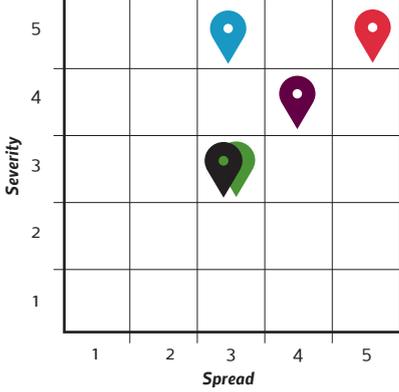
BARRIERS to RES deployment

ELECTRICITY

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
GOVERNMENT UNWILLING TO AIM HIGH	In 2012, Sweden already reached its 2020 target of 49% RES. The Government has to raise RES targets to a sensible level to foster investments and technology development.	
CERTIFICATE SYSTEM	After a rapid expansion of the certificate system, it now hampers technological development in the industry, affecting particularly SME investing in RES. The problem increased in the last two years due to falling electricity prices.	
MILITARY OPPOSED TO WIND TURBINES	Swedish Armed Forces believe that turbines interfere with the JAS aircraft (50% of Sweden's land area is affected).	
LOW RES PRICEST	Low price of electricity from RES affects mainly wind, solar and wave energy. The Government allows surplus electricity produced by old nuclear power plants.	
COSTS FOR SMALL-SCALE ELECTRICITY PRODUCERS	The electricity from RES which is not consumed directly, is subject to a sales tax, energy tax and certificate fee. Surplus RES electricity is subject to a fee by the RES producers.	

HEATING AND COOLING

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
GOVERNMENT UNWILLING TO AIM HIGH	In 2012, Sweden already reached its 2020 target of 49% RES. The Government has to raise RES targets to a sensible level to foster investments and technology development.	
SUPPORT AND REGULATORY FRAMEWORK	Lack of clear support schemes and ambitious targets for RES hinders the development of new technologies, mainly affecting solar, wind and biogas technologies	
PROHIBITION ON HEAT PUMPS	Some municipalities oblige property owners to accede to district heating, thus preventing property owners to install heat pumps. The barrier affects all RES-H&C technologies except for district heating.	
ENERGY REQUIREMENTS FOR NEW BUILDINGS	The Government does not specify building requirements for nearly zero energy buildings. Construction companies are reluctant to invest in skills development and energy efficient building systems for low energy houses.	
ELECTRICITY HEATING	The small scale market, mostly single family houses, still uses a lot of electric heating as a consequence of the development of nuclear power plants in the 80s and 90s.	

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
 GOVERNMENT UNWILLING TO AIM HIGH	Sweden having already achieved its RES target for 2020, the Government has to distinctly raise RES targets to foster RES investments and technology development.	
 SUPPORT AND REGULATORY FRAMEWORK	Lack of clear support schemes and ambitious targets for RES hinders the development of new technologies, mainly affecting solar, wind and biogas technologies.	
 POLICY INSTRUMENTS FOR BIOFUELS	Although bio-energy is the largest source of energy in Sweden, there is no clear information on policy instruments for biofuels after 2013, hindering new investments.	
 DISCRIMINATION SUBSIDISATION	Development of biofuel is slowing down, whereas fossil fuels are subsidised to an excessive degree. This barrier mainly impacts complex systems for biogas and biofuel.	
 LACK OF PROFITABILITY	New installations are held back when the pricing is too poor for RES. The barrier affects biogas and biofuels.	

Severity: 1 - almost negligible effects, 2 - minor effects, 3 - moderate effects, 4 - substantial effects, 5 - severe effects

Spread: 1 - impacts sporadic installations, 2 - affects a small fraction, 3 - affects a moderate share, 4 - affects a predominant share, 5 - concerns almost all installations

KEY TRENDS IN THE RES SECTOR

- Sweden already reached its 2020 RES target of 49% in 2012. This success is at the same time the most severe barrier for further RES deployment in all sectors in Sweden.
- Renewable electricity is supported in Sweden by an inefficient system of green certificates. The system has led to a rapid expansion, but the risk is now high that the technological development in the industry is hampered, among other things, by the low price of energy for the producers.
- The Swedish Armed Forces question the deployment of wind turbines in Sweden arguing that they interfere with the JAS aircraft. This is a serious threat to achieving the target of 30 TWh of wind power in 2020.
- The Government does not specify building requirements for nearly zero-energy buildings. Construction companies are unsure of Sweden's ambition. The energy efficiency targets for buildings will not be achieved if the Government does not clarify requirements for nearly zero-energy buildings.
- Biofuels in the transport sector are currently supported via tax exemptions. This regulation may not be continued due to concerns within the European Commission, favours stopping this tax exemption due to state aid rules. There is currently no clear information on policy instruments for biofuels after 2013.

POLICY RECOMMENDATIONS

- The Government should urgently raise the renewable energy target to a level corresponding to what Sweden actually can deliver i.e. 70% or higher.
- The Government should :
 - Introduce feed-in tariffs as in most other European countries.
 - Provide energy intensive industries a certain quota of green certificates, which they currently lack, to reduce the surplus of certificates.
 - Introduce a guaranteed minimum price to secure profitable investments.
- The Government and Parliament must set clear energy requirements for nearly zero-energy buildings.
- The target for renewable fuels in the transport sector in Sweden (10 % until 2020) has already been reached. The Government should establish new ambitious targets for the transport sector of for instance 25 % renewable fuel (and 20 % biofuel) by 2020.
- Sweden lacks clear support schemes which hampers investment in new facilities and affects the development of renewable fuels. The Government should present clear and stable information on policy instruments, legislative and regulatory framework concerning biofuels support schemes.



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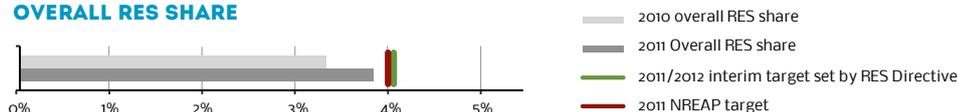
Is the United Kingdom ON TRACK?

- The United Kingdom is slightly off track regarding its 2011 NREAP target. Based on 2011 data, it has not yet achieved its 2011/2012 interim target.
- Average annual growth in RES overall has decreased between 2010 and 2011 compared to the prior six year average, with the transport sector even showing a negative growth trend.
- Growth rates in the electricity and heat sectors would be sufficient to reach the 2020 target.

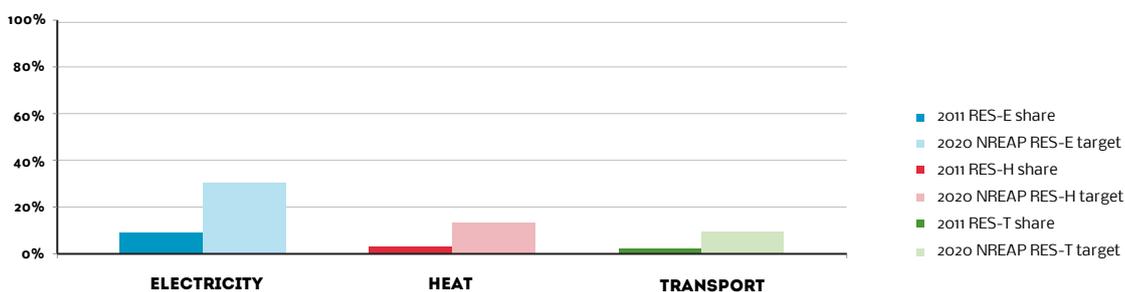
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OVERALL RES SHARE

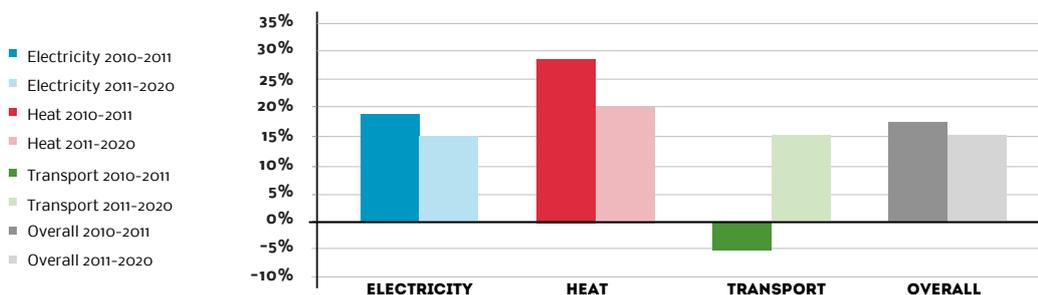


2011 RES SHARE COMPARED TO 2020 TARGET IN SECTORAL GROSS FINAL ENERGY DEMAND



	ELECTRICITY	HEAT	TRANSPORT	TOTAL
2011 actual share of RES in sectoral gross final energy demand	8.7%	2.2%	2.9%	3.8%
2011 NREAP target	10%	1%	3.4%	4%
2011/2012 interim target set by RES Directive	-	-	-	4%
2020 NREAP target	31%	12%	10.3%	15%
Percentage of sector consumption in total final energy consumption in 2011	23%	38%	38%	100%
2011 Production [ktoe]	2.782	1.160	1.087	5.028
2010 Production [ktoe]	2.410	1.068	1.167	4.645
2005 Production [ktoe]	1.456	571	0	2.027
2020 NREAP target production [ktoe]	10.059	6.199	4.251	20.510
Deviation [%] of actual from planned share in 2011	-12.83%	123.96%	-14.11%	-4.01%

2010-2011 RES GROWTH RATES VS. AVERAGE ANNUAL GROWTH RATES REQUIRED TO MEET THE 2020 TARGET





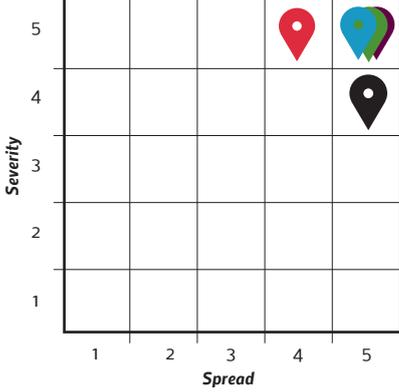
BARRIERS to RES deployment

ELECTRICITY

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
POLICY UNCERTAINTY AND RISK	Low confidence in the market due to mixed signals from the Government, uncertainty over the future of support measures and intense pressure to reduce costs.	
GRID RELATED ISSUES	The lack of a clear plan and measures to support distributed generation. Uncertainty that grid extensions to capture remote resource will be made, or made in time.	
PLANNING ISSUES	Obtaining planning permission is becoming increasingly difficult for some technologies, not helped by mixed signals from Government ministers.	
SECURITY OF BIOMASS FUEL SUPPLY	Developers and funders are concerned that the necessary quantity and quality of biomass fuel may not be available, at least at the current price, over the life of a biomass power plant project.	
LACK OF SKILLED WORKFORCE	Uncertainty over the future of support measures discourages companies from entering the sector and acquiring the necessary skills to undertake installations.	

HEATING AND COOLING

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
POLICY UNCERTAINTY AND RISK	Low confidence in the market due to mixed signals from Government, uncertainty over the future of support measures and intense pressure to reduce costs.	
LACK OF SKILLED WORKFORCE	Unfamiliarity with renewables and complexity of support discourages companies from entering the sector and acquiring the necessary skills to undertake installations.	
AWARENESS OF RES-H&C AND RHI	Lack of awareness and understanding among the public and industry of renewable heat opportunities. Renewable Heat Incentive (RHI) does not yet cover the domestic sector. Complicated nature of RHI adds to the uncertainty.	
SUSTAINABILITY CRITERIA	UK proposes to impose sustainability criteria within the RHI in 2014. There is uncertainty regarding the implementation details and potential administrative burdens once these are finalised.	
DISTRICT HEATING	District heating is poorly developed in the UK, largely because of the lack of a clear Government support policy and due to a wide range of legal and regulatory issues.	

BARRIER	DESCRIPTION	SEVERITY AND SPREAD
 POLICY UNCERTAINTY AND RISK	Low confidence in the renewable transport liquid fuels market due to Government's lack of commitment to go beyond 5% biofuels by volume by April 2014 and the uncertainty caused by the European Commission's recent biofuels proposals.	 <p>The grid shows severity on the y-axis (1-5) and spread on the x-axis (1-5). Markers are placed at (4,4) with a red pin, (5,4) with a blue pin, and (5,5) with a black pin.</p>
 5% CAP ON 1ST GEN. BIOFUELS	The 5% cap on crop based biofuels proposed in October 2012 impacts all current producers and investors and risks severely damaging market stability.	
 TARGET TO SUPPORT BIOFUELS PAST 2020	The absence of a RES-T trajectory beyond 2020 undermines confidence in the biofuels sector. Banks are reluctant to commit funds and construction of additional facilities is hindered.	
 ENCOURAGEMENT FOR 2ND GEN. BIOFUELS	The fact that there is not enough confidence in the biofuels markets as a whole means that, even with double or quadruple counting, investment in 2 nd generation is not incentivised.	
 GOVERNMENT RELUCTANCE TO INTRODUCE E10	Lack of positive Government support for E10 further reduces investor confidence, and underlines the impossibility of reaching the 10% RES-T target at current biofuel blend levels.	

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Spread: 1 - impacts sporadic installations, 2 - affects a small fraction, 3 - affects a moderate share, 4 - affects a predominant share, 5 - concerns almost all installations

KEY TRENDS IN THE RES SECTOR

Developers of RES projects in the UK face increasing difficulties obtaining equity and debt financing for projects. In terms of its commitment to RE, the Government has been sending very mixed signals impacting on industry confidence. Whilst renewables retain strong public support, a vocal minority objecting on the grounds of cost and environmental impact created challenges for the industry.

- **FITs:** The scheme, introduced in 2010 for small-scale generation, went through major upheaval in 2011/12 due to great uptake of PV, resulting in legal action and denting market confidence. The scheme has since been reformed by applying a capacity based degression mechanism.
- **Renewables Obligation (RO):** the RO has successfully supported large-scale power generation since 2002. The Government has been reviewing technology banding

levels for over a year, creating considerable uncertainty for investors. It will be closed to new projects in 2017 having been gradually replaced by the Electricity Market Reform from 2014, creating further uncertainty.

- **Renewable Heat Incentive** is similar in principle to FITs, payable to users of renewable heat. The 1st phase came into force at the end of 2011, targeting the non-domestic sector. The 2nd phase, due in summer 2014, expands the scheme as well as introducing the scheme in the domestic sector.
- **The Renewables Transport Fuel Obligation (RTFO)** obligates fuel suppliers to meet mandatory carbon and sustainability criteria in order to achieve RTF-Certificates. The RTFO has been amended twice since its introduction in 2008 yet it lacks a trajectory to reach the 10% target by 2020 and does not go beyond 5% by volume to be reached by April 2014.

POLICY RECOMMENDATIONS



ELECTRICITY SECTOR

- There needs to be clarity in terms of the future of the Renewables Obligation.
- Uncertainties over how the Electricity Market Reform will work in practice need to be overcome.



HEATING AND COOLING

- The forthcoming changes to the RHI need to be timely and clear to instill confidence.
- There needs to be a clear and ambitious budget set for the RHI past 2015 to ensure visible commitment to the scheme.



TRANSPORT SECTOR

- Clear long term targets for 1st generation biofuels should be kept in line with the original targets and should continue beyond 2020.
- The 10% 2020 target could be differentiated for first and second generation biofuels.
- Review and improve International Food Policy Research Institute modeling for indirect land use change factors.



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METHODOLOGY

and data sources

To compare future projections based on the NREAPs and actual developments, the following methodology was used.

NREAP PROJECTIONS:

The trajectories planned for each RES technology until 2020 are publicly available in the National Renewable Energy Action Plans (NREAPs) submitted to the European Commission by every Member State in 2010.

The following assumptions were made to handle gaps and inconsistencies in the NREAP data:

- **Wind data:** in the NREAPs, Member States were asked to give data for wind on and offshore, and an overall figure for wind. Some Member States only provided the overall figure (Belgium, Finland). In the case of Finland, it was assumed that the Member State was exactly on track in offshore wind, and the remaining planned generation was assumed to be onshore wind. For Belgium, direct communication with the administration led to a breakdown into subcategories based on national figures.
- **Biomass data:** similarly to wind, if a Member States did not provide values for the sub-categories solid biomass, biogas, and bioliquids in their NREAP (Estonia), it is assumed that the Member State is exactly on track in biogas and bioliquids. The remaining planned generation is assumed to be solid biomass.
- **Hydropower:** for Member States who did not report on hydro subcategories (Belgium, Bulgaria, Ireland, the Netherlands, and the UK), the same approach as for wind and biomass was used.

ACTUAL DEVELOPMENT:

Member States were requested to submit the first of six biannual Progress Reports to the Commission by 31st December 2011, - with data covering the years 2009/2010, to monitor compliance with their planned trajectories and measures. The next round of Progress Reports is not due before the end of 2013. Therefore, to assess the progress made by 2011, this report relies on data published by EUROSTAT in early 2013. This is complemented by additional data sources such as EurObserv'ER, official national statistics, and data provided by national Renewable Energy Industry Associations. In

addition to energy balances, EUROSTAT now also provides RES overall shares and sector shares calculated according to the methodology stipulated in Directive 2009/28/EC. These shares were used in the RES overall and RES sector analysis.

The following assumptions were made to handle data gaps and inconsistencies:

- EUROSTAT only provides overall wind figures. To allocate electricity production to either onshore or offshore, this analysis relies on offshore wind capacity data by EurObserv'ER.
- EUROSTAT provides capacity data for different sizes of hydro installations, but only an overall hydro figure for generation. Generation was allocated to size categories using capacity data and assumptions on full-load hours.
- RES shares are calculated and published by EUROSTAT according to the methodology stipulated in Directive 2009/28/EC, taking into account additional information from the Member States which is not publicly available. This report relies on EUROSTAT-calculated shares for all Member States which were published by 29th April 2013. In this version, Eurostat uses estimates for Hungary and Belgium regarding data for heat pumps, mixed hydro, and biofuels compliant to sustainability criteria. The Eurostat estimates for Hungary were used in this report, while own estimates for Belgium were applied.

DATA PROVIDED IN THE ANALYSIS BY MEMBER STATES SECTION:

In the pages referring in this publication to individual Member States:

- Absolute production figures provided on sector level for 2005, 2020, and 2011 refer to target-relevant production. This includes multiple counting of compliant bioliquids and RES-E in road transport. In the transport sector, the figure refers to consumption. Since biofuels are an easily traded good, the amount produced nationally is not relevant.
- Growth rates on the Member State page refer to growth in shares, not absolute figures.



ABBREVIATIONS

CHP	Combined Heat and Power
DH	District Heating
EC	European Commission
EE	Energy Efficiency
FiT	Feed-in Tariff
GC	Green Certificate
GW	Gigawatts
H&C	Heating & Cooling
NREAP	National Renewable Energy Action Plan
PV	Photovoltaics
RES	Renewable Energy Sources
RES-E	Renewable Electricity
RES-H&C	Renewable Heating & Cooling
RES-T	Renewable Transport
RES Directive	Renewable Energy Directive (2009/28/EC)
RHI	Renewable Heat Incentive
RTFO	Renewable Transport Fuels Obligation
TSO	Transmission System Operator
TWh	Terawatts per hour

TEXT AND ANALYSIS

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