EUROPEAN
COMMISSION

Brussels, 15.11.2022
COM(2022) 639 final

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

2022 Report on the Achievement of the 2020 Renewable Energy Targets

1. INTRODUCTION

Renewable energy is a key element in the EU's fight against climate and environmental-related challenges as also highlighted in the State of the Energy Union report, published on 18 October 2022.[1] Under the European Green Deal[2], the European Commission has proposed a new strategy to transform the EU economy and society and to put it on a more sustainable path. The increased ambitions to reduce net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels, and to become the first climate neutral continent by 2050, can only be achieved with an integrated energy system, largely based on renewable energies. Therefore, the Commission proposed in July 2021 to amend Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources (RED II)[3] and increase the share of renewable energy in the gross final energy consumption in 2030 to at least 40%[4], up from the ambition of at least 32% set in RED II.

Following Russia's unprovoked and unjustified military aggression against Ukraine, the EU published its REPowerEU Plan[5] with the aim of rapidly reducing the EU's dependence on Russian fossil fuels. The REPowerEU Plan proposes an additional set of measures to save energy, diversify supplies, and quickly substitute fossil fuels by accelerating Europe's clean energy transition. To deliver on the REPowerEU Plan, it will be necessary to accelerate and frontload the deployment of renewable energies and transform industrial processes to replace gas, oil and coal. As part of the REPowerEU Plan, the Commission presented a new proposal to amend RED II[6]. Therein, the Commission proposes raising the 2030 renewable energy target to at least 45%. Through further simplification and shortening of the administrative procedures for permit-granting, strategic planning carried out by the Member States and fostering projects in areas particularly suitable for the deployment of renewable energy, the proposal aims to ensure a faster roll-out of renewable energy projects.

Renewable energy is therefore key to achieving climate goals, security of supply and independence from Russian energy imports.

The 2030 framework for support of renewables builds on the progress made under Directive 2009/28/EC on the promotion of the use of energy from renewable sources (RED I)[7], which was in force until 30 June 2021. Under RED I, Member States had to meet individual national targets for 2020, which were consistent with an EU-wide renewable energy target of at least 20%. As Article 27 of the Governance Regulation (EU) 2018/1999[8] requires, Member States had to report

[1] COM(2022) 547 final.

[2] COM(2019) 640 final.

[3] Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources, OJ L 328, 21.12.2018, p. 82.

[4] COM(2021) 557 final.

[5] COM(2022) 230 final.

[6] COM(2022) 222 final.

[7] 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, OJL 140, 5.6.2009. p. 16.

[8] Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, OJ L 328, 21.12.2018, p. 1.

to the Commission on the achievement of their national renewable energy targets for 2020 by 30 April 2022.

The information provided by the Member States in their reports, complemented with the data from Eurostat and available scientific literature[9], is summarised and analysed in the present document.

This Commission's report consists of five chapters. Following the introduction, Chapter 2 provides an overall EU level assessment on the progress in deploying renewable energy. Chapter 3 examines the previous findings in the light of the impacts of the COVID-19 pandemic. Chapter 4 adds a more detailed analysis of the findings in the individual Member States, including best practice examples. Chapter 5 provides the conclusions.

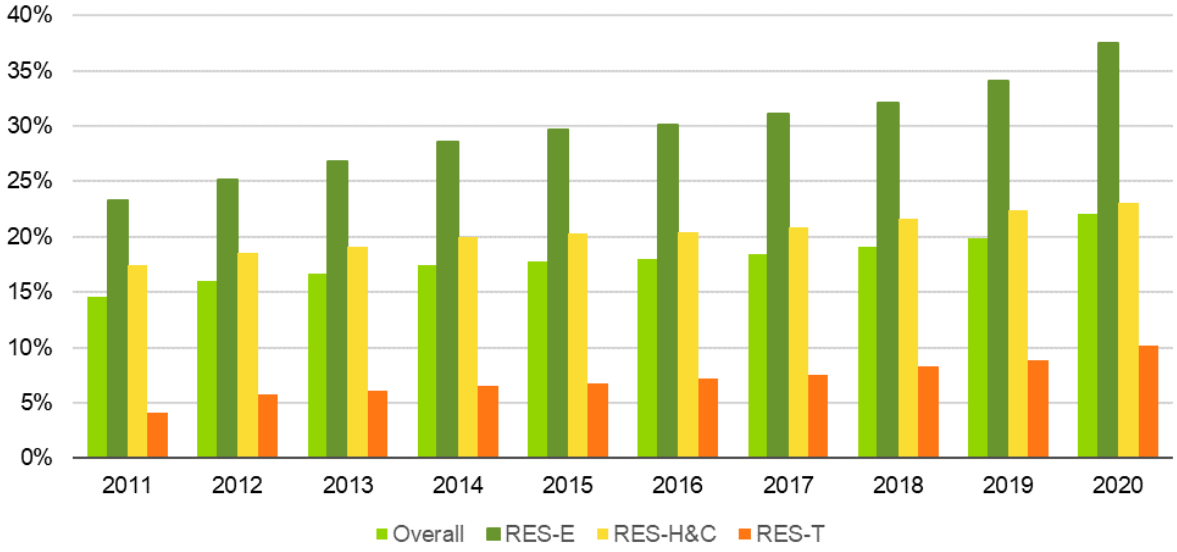
2. EU PROGRESS IN DEPLOYING RENEWABLE ENERGY

In 2020, **the EU reached a share of 22.1% of renewable energy in gross final energy consumption, thus exceeding the 20% share aimed at under RED I.** On average, the overall renewable energy share has been increasing by 0.8 percentage points annually since 2011, with a much stronger increase of 2.2 percentage points between 2019 and 2020. Also, in the **individual sectors – electricity, heating and cooling, and transport** – the shares of renewable energy have increased steadily over the last decade.

The relative share of renewables was largest in the **electricity (RES-E) sector** with a contribution of 37.5% in 2020. The sector saw an especially strong increase of 2 percentage points from 2018 to 2019 and of 3.4% from 2019 to 2020. The share of renewables in the **heating and cooling** (**RES-H&C**) **sector** reached 23.1% in 2020 and has thereby increased by 5.7 percentage points in the last ten years. For the **transport (RES-T) sector**, the shares reached 10.2% in 2020; overall, the development was less dynamic and slower.

[9] A main contributor is the following technical assistance report "Assessment of Member States' reports for the year 2020" [DOI 10.2833/12592] by Guidehouse Germany GmbH, published on 7 October 2022. The study is contracted by the European Commission.

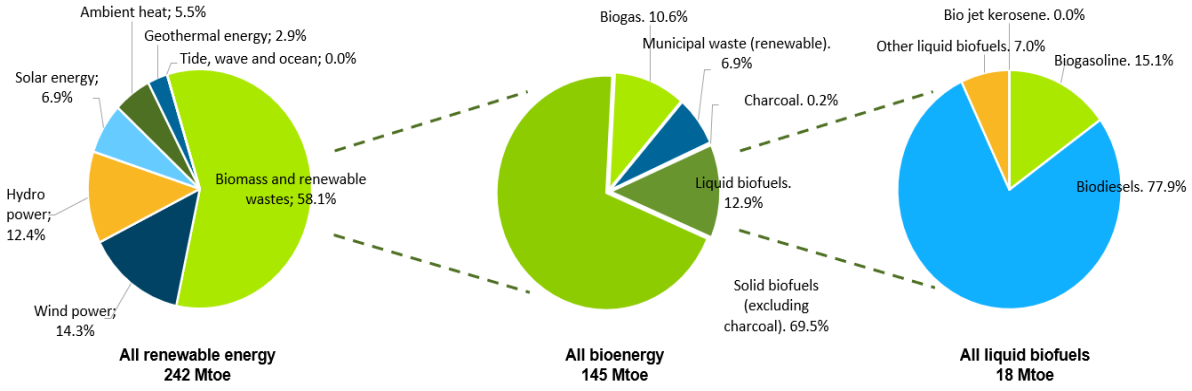
Figure 1. EU-27 RES-shares 2011-2020 (%). Source: Eurostat SHARES.



Bioenergy continues to be the main source of renewable energy in the EU, with a share of 58.1% in 2020. Wind power follows with 14.3%, hydropower with 12.4%, solar energy (6.9%), ambient heat (5.5%) and geothermal energy (2.9%).

For bioenergy, solid biofuels represent the largest share with 69.5%. The other forms of bioenergy are liquid biofuels (12.9%), biogas (10.6%), the renewable share of municipal waste (6.9%) and charcoal (0.2%).

Figure 2. Gross EU consumption of renewable energy per type (2020, % and Mtoe). Source: Eurostat.



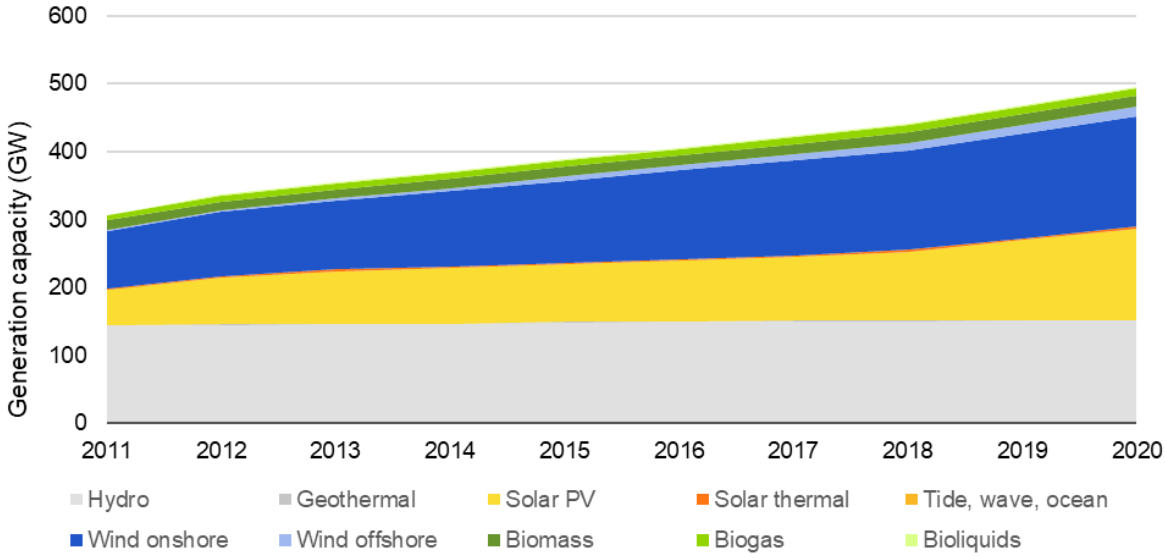
RES-E sector

Between 2011 and 2020, the share of RES technologies in the total electricity generation has seen a continuous increase. In 2020, for the first-time, onshore wind held the largest share in

RES-E technologies with 350 TWh production in 2020, followed by 345 TWh for hydro, solar photovoltaics (PV) with 139 TWh, solid biomass with 83 TWh, biogas with 56 TWh, offshore wind with 47 TWh. Geothermal electricity (6 TWh), solar thermal (5 TWh) and bioliquids (5 TWh) played minor roles in the RES-E mix.

The installed **RES-E generation capacity** observed in 2020 corresponds to the results shown for RES-E production above. In 2020, the technology with the highest installed capacity was wind onshore with 162.5 GW with a significant increase from 2019 to 2020 of 7.4 GW added. Hydro had the second largest generation capacity (150.8 GW), however, its total installed capacity has remained largely unaltered with an increase of only 6.5 GW in the last 10 years. Hydropower is followed by solar PV which increased from 117.9 GW in 2019 to 135.7 GW in 2020 (+17.7 GW). Wind offshore increased from 12 GW in 2019 to 14.5 GW in 2020. Biomass (15.6 GW), Biogas (11.7 GW), Bioliquids (1.2 GW) and Geothermal (0.9 GW) had a relatively smaller share of the RES-E generation capacity in 2020.

Figure 3. RES-E generation capacity in the EU-27 for 2011-2020. Source: Eurostat SHARES.



The quicker development of RES-E compared to RES-T and RES-H&C has been facilitated by the reduction of technology costs over time.

More specifically, in the **Onshore Wind sector**, overall installation, operation, and maintenance costs as well as Levelized Costs of Electricity (LCOE) have decreased in the last decade due to economies of scale, larger competition, and the maturation of the industry. Between 2010 and 2020, the global weighted-average LCOE declined by 54% from USD 0.089/kWh to USD 0.041/kWh. Additionally, onshore wind turbine technology has significantly advanced in the past years. Factors like increased hub-heights, greater rotor diameters, and larger, more reliable turbines have all promoted increased capacity.

In the **Offshore Wind Sector**, the global weighted-average LCOE declined by 48% between 2010 and 2020, from USD 0.162 to USD 0.084/kWh, with a 9% reduction year-on-year in 2020. These reductions have been driven by technology improvements as well as industry related factors, such as growing developer experience and greater production standardisation.

Significant cost reductions can also be observed in the **Solar PV sector**. Between 2010 and 2020, the global weighted-average LCOE of utility-scale PV plants declined by 85% from USD 0.381/kWh to USD 0.057/kWh. At the same time, production has continuously been expanded and optimized, and overall, the efficiency of the modules has been increased.

RES-H&C sector

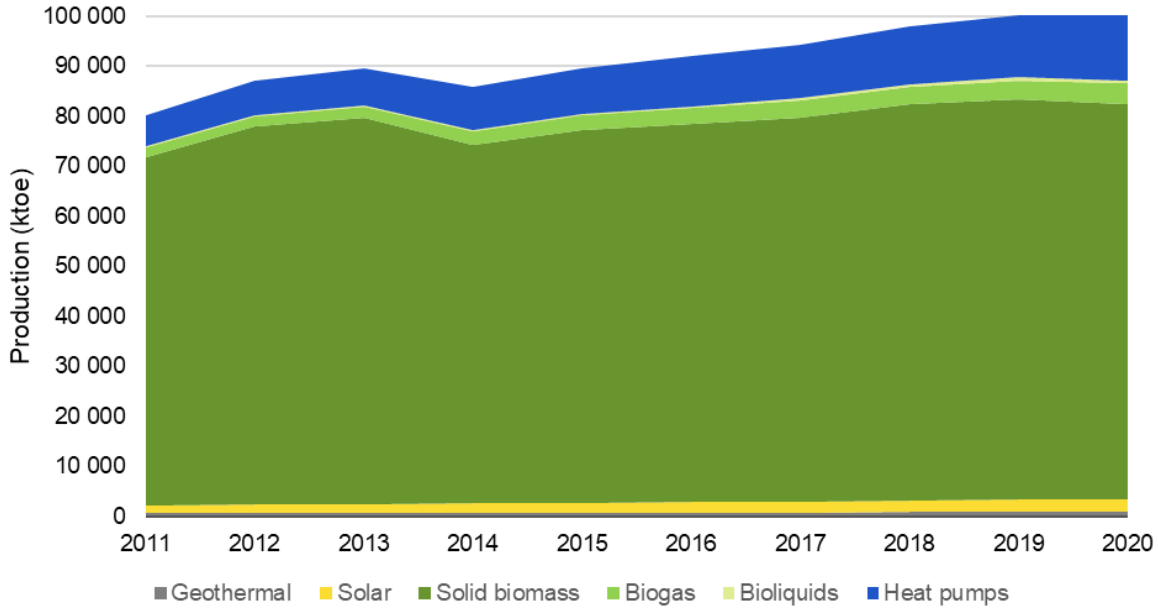
The consumption of renewable energies in the RES-H&C sector has increased gradually over the last decade.[10] In 2020, RES-H&C consumption at EU-level reached 100 561 ktoe. Solid biomass was the largest renewable energy contributor to the sector with 79 151 ktoe. Energy consumption from heat pumps stood at 13 316 ktoe, biogas at 4 055 ktoe, solar thermal heating at 2 503 ktoe, bioliquids at 669 ktoe and geothermal heating at 867 ktoe.

Compared to 2004 (11.7%), the share of renewably-sourced energy in heating and cooling has practically doubled in the European Union. This expansion can be attributed to lower heating needs, but most of all to the increase in renewable heat from heat pumps. The European Union-wide heat pump market data for 2020 confirm its increased deployment in the heating and cooling segment, spurred partially by policies in several countries favourable to electrifying heating needs (e.g. France, Finland, Sweden) and the increase in summer cooling needs for the area of reversible heat pumps in cooling mode. Other sectors apart from heat pumps have boosted the increase in total renewable heat consumption – biogas, renewable municipal waste, solar energy and bioliquids. Between 2019 and 2020, the distribution between the various renewable heat sectors worked to the detriment of solid biofuel (from 76.3 to 75%) and to the benefit of heat pumps (from 11.8 to 12.7%). The biogas share rose from 3.6 to 3.9%, the renewable municipal waste share from 3.7 to 3.8%, solar from 2.3 to 2.4%, geothermal energy remained at 0.8% and bioliquids from 1 to 1.1%[11].

[10] Since the Delegated Act establishing the methodology to calculated renewable cooling was adopted on 14 December 2021, the renewable heating and cooling shares for 2020 do not yet include contribution from renewable cooling.

[11] https://www.eurobserv-er.org/category/all-annual-overview-barometers/ .

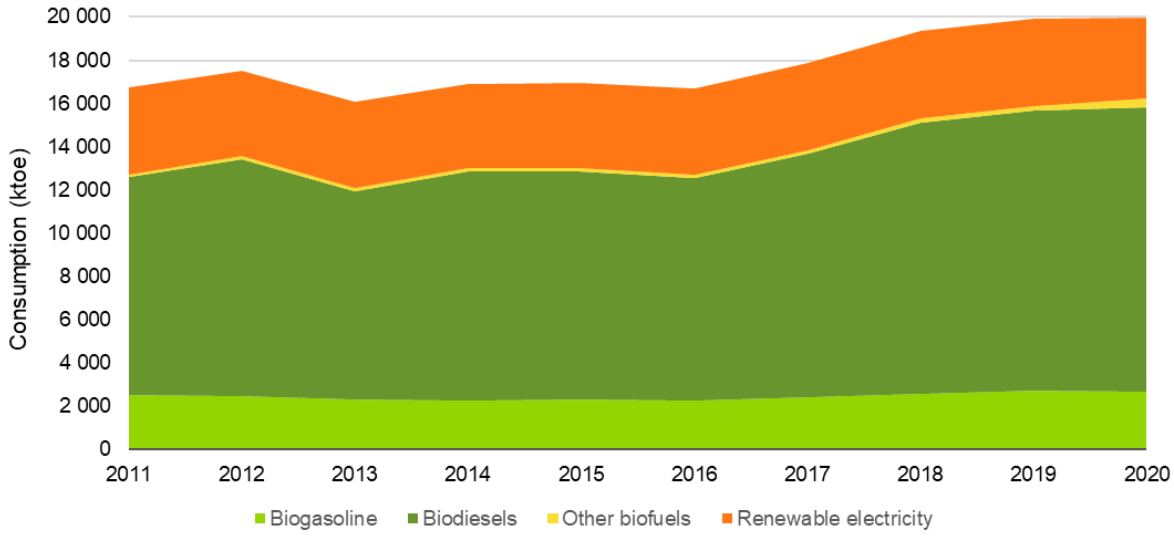
Figure 4. Production of heating and cooling from RES-H&C technologies in the EU-27 for 2011-2020. Source: Eurostat SHARES.



RES-T Sector

Overall, the consumption of renewable energies in the RES-T sector has increased steadily over the last decade. The consumption of biodiesel and bioethanol had stagnated between 2014 and 2016 but has been increasing ever since. Due to the high contribution of biodiesel and bioethanol to the RES-T sector, the development of these biofuels has led to a growth in biofuel consumption in total since 2016. The most widely used fuel over the full period was biodiesel, which is also the largest contributor to RES-T in 2020, with 13 164 ktoe. The use of renewable electricity for transport has significantly increased over the last 10 years. A particularly large increase took place in the road transport sector which moved from 10 ktoe in 2011 to 112 ktoe in 2020. However, compared to the other transport modes, especially rail transport, the contribution of electricity in road transport is still minor. Consumption of food and feed crop based-biofuels continues to represent a large share of renewable energy consumption in transport (10 808 ktoe or 4.5% of transport energy consumption in 2020) while the consumption of advanced biofuels was lower but increased significantly in recent years (1 224 ktoe in 2020).

Figure 5. Consumption of energy in transport (RES-T) in the EU-27 for 2011-2020. Source: Eurostat SHARES.



3. COVID-19 EFFECTS

The share of renewable energy of 22.1% in the EU as a whole was also affected by lower overall energy consumption due to the **COVID-19 pandemic.** It had a **severe impact on the level of energy demand** in the Member States, also when taking into account other factors, such as weather fluctuations and implementation of energy efficiency policies which may also have played a role in the decrease of the total gross final consumption in a given year. In the whole of the EU, **final energy consumption dropped by 8% compared to 2019**. The decrease varied between Member States with Luxembourg (-13.7%) and Spain (-12.3%) registering the highest drop in consumption, whereas Sweden (-2.4%) and Romania (-1.4%) only experienced a slight decrease.

On the **supply side**, in general terms, RES generation was less affected than other energy sources. Power plants operating on solar, wind and pure hydropower could run their operations since their ability to generate electricity depends on weather and not on demand. Similarly, electricity production from dispatchable RES like biomass appeared to be hardly affected since their operation is largely driven by RES support (which in general was not affected by the COVID-19 pandemic). For biofuels in transport or biomass used for heating purposes, however, the crisis associated with lower demand had visible impacts[12].

These factors translated into a **shift towards a higher share of RES generation in the power**

[12] Klessmann, C., Sach, T., Grigiene, M., et al., Technical assistance in realisation of the 5th report on progress of renewable energy in the EU final update report. Task 1 & 2, Publications Office of the European Union, 2021.

mix[13] which was only partially due to **the actual new installed capacity.** Overall, **it can be concluded that** lower energy consumption made target achievement easier for the Member States.

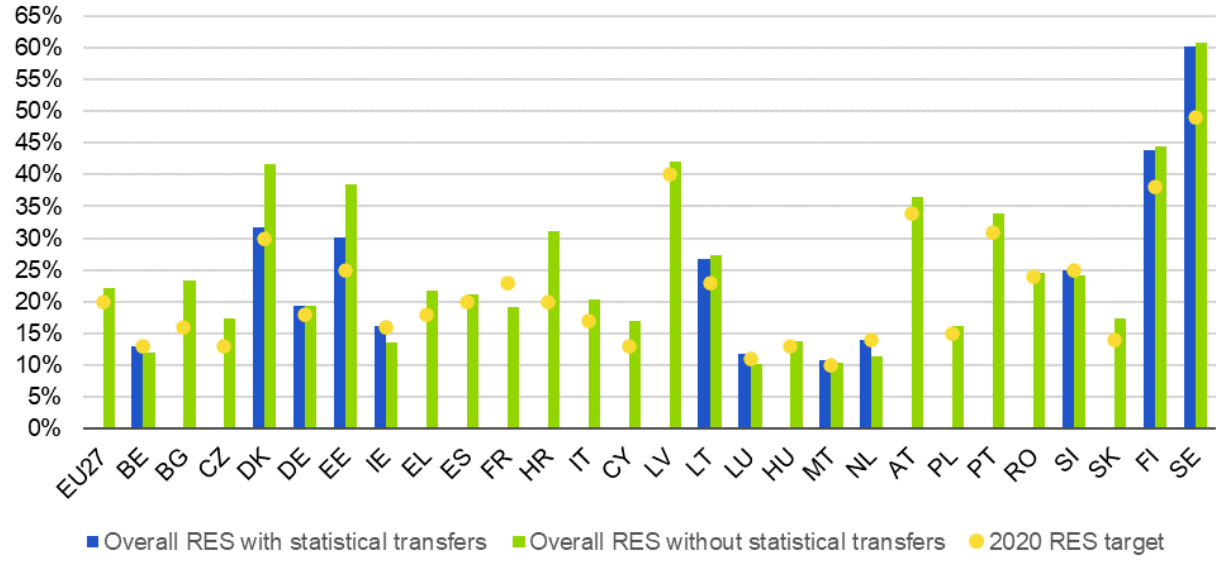
4. DETAILED ASSESSMENTS OF MEMBER STATES PROGRESS

4.1. Overall renewable energy shares per Member State

The renewable energy shares in 2020 vary widely across Member States, reflecting the different starting positions and national targets set for each Member State in RED I. Sweden achieved the highest renewable energy share in 2020 (60.1%), followed by Finland (43.8%) and Latvia (42.1%). The lowest renewable energy shares were seen in Malta (10.7%) and Luxembourg (11.7%). Despite their low overall renewable energy share, Malta and Luxembourg increased their renewable energy shares from 2019 to 2020 by +2.5 percentage points and +4.7 percentage points, respectively (including statistical transfers).

Considering both national deployment and currently notified statistical transfers, all Member States except from France achieved a share equal to, or higher than, their 2020 binding renewable energy target under RED I. Some Member States exceeded their targets by far; Sweden was 11.1 percent points above its target, Bulgaria 7.3 percentage points, and Finland 5.8 percentage points.

Figure 6. Overall RES shares with and without statistical transfers vs. 2020 RES targets. Source: Eurostat SHARES; RED I Directive.

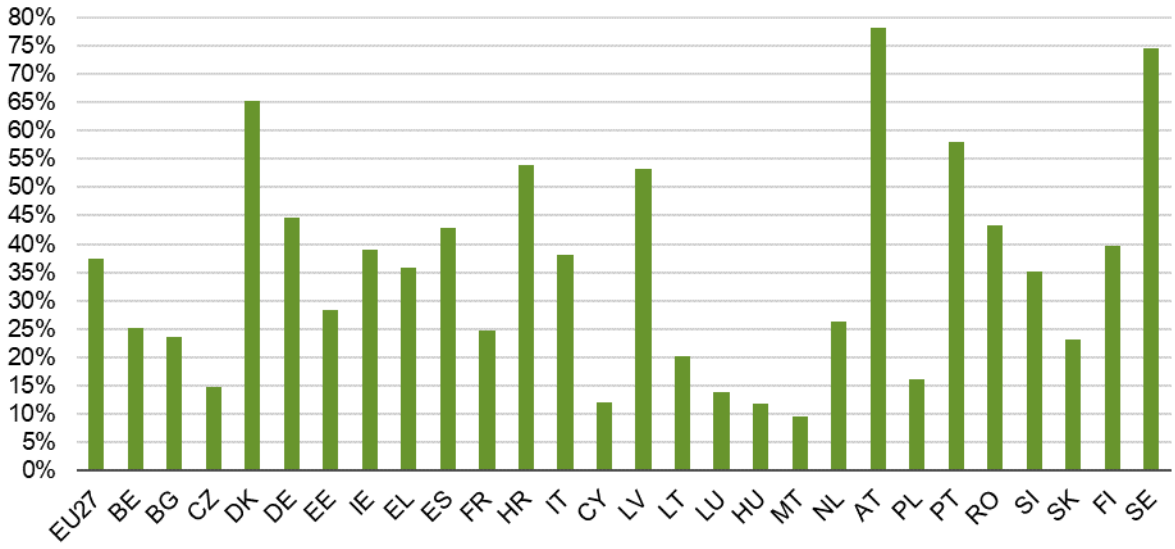


[13] EIA, Covid-19 impact on electricity report, 2021, Covid-19 impact on electricity – Analysis - IEA .

4.2. Progress in the individual sectors: electricity, heating & cooling and transport

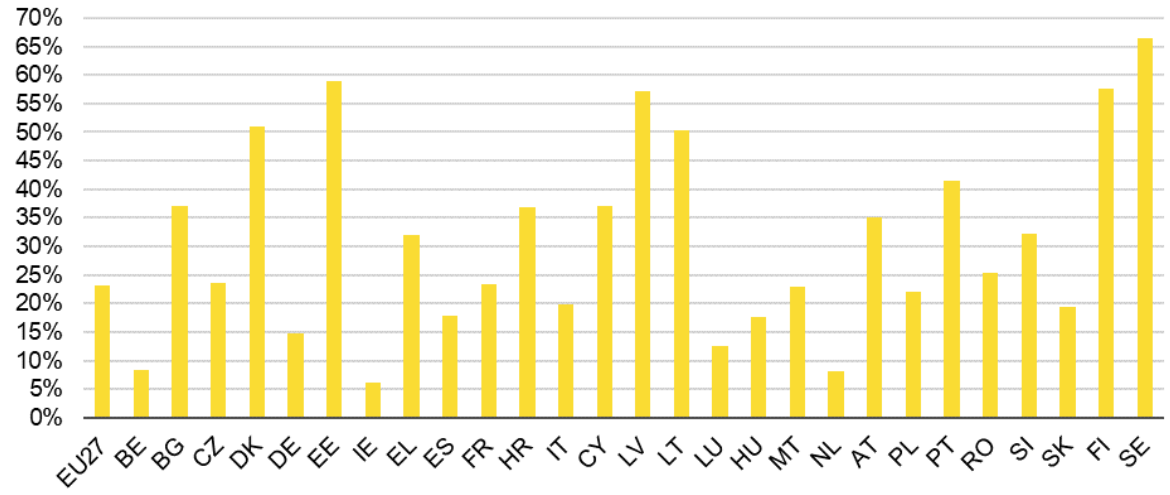
In the **RES-E sector**, Austria had the highest RES-E share in 2020 with a share of 78.8%, followed by Sweden (74.5%) and Denmark (65.3%). Malta (9.5%), Hungary (11.9%) and Cyprus (12.4%) had the lowest RES-E share of all Member States in 2020.

Figure 7. RES-E share per Member State in 2020. Source: Eurostat SHARES.



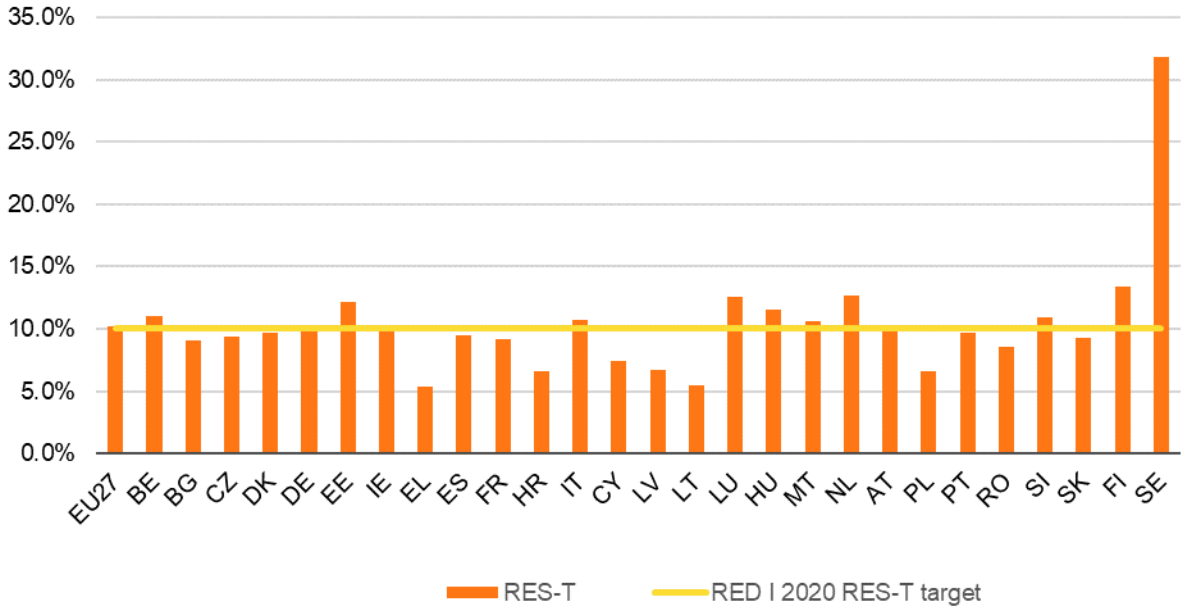
In the **Heating and Cooling sector**, Sweden (66.4%) had the highest share of renewable energy in 2020, followed by Estonia (58.8%), Finland (57.6%) and Latvia (57.1%). In contrast, Ireland (6.3%), the Netherlands (8.1%) and Belgium (8.4%) had the lowest renewable energy share in Heating and Cooling.

Figure 8. RES-H&C share per Member State in 2020. Source: Eurostat SHARES.



In the **transportation sector**, the highest shares can be observed in Sweden, where the RES-T share stood at 31.9%, followed by Finland (13.4%) the Netherlands and Luxemburg (both 12.6%). Among all Member States, Greece (5.3%), Lithuania (5.5%), Poland and Hungary (both 6.6%) showed the lowest RES-T share in 2020.

Figure 9. Share of renewable energies in transport in the EU-27 for 2011-2020. Source: Eurostat SHARES.



4.3. Cross-border collaboration and the use of cooperation mechanisms

RED I foresees four different types of cooperation mechanism: statistical transfers, joint projects between Member States, joint projects between Member States and third countries and joint support schemes. Out of these mechanisms, Member States made most intensive use of the statistical transfers[14]. Lithuania, Luxembourg, Estonia, Belgium, Finland, Czech Republic, Slovenia, Malta, Netherlands and Ireland participated in statistical transfer agreements that took effect in 2020; some of the participating Member States achieved their binding renewable energy target for 2020 as a result of statistical transfers. An overview of the statistical transfers and their quantities is presented below.

Figure 10. Statistical transfers that took effect in 2020. Source: Eurostat SHARES.

Member State – Seller	Member State – Buyer	Amount of RES statistics (GWh)
Lithuania	Luxembourg	250
Estonia	Luxembourg	400
Denmark	Belgium	1800
Finland	Belgium (Flanders)	250
Czech Republic	Slovenia	465
Finland	Belgium (Flanders)	20
Lithuania	Belgium (Brussels Capital)	152
Finland	Belgium (Flanders)	1650
Estonia	Malta	20
Denmark	Netherlands	13650
Estonia	Ireland	2500
Denmark	Ireland	1000

The other cooperation mechanisms remained largely unused, whereby the already established joint support schemes between Germany and Denmark and Sweden and Norway continued to deliver results[15]. Nevertheless, the cross-border collaboration in the form of joint projects is expected to be further incentivized following the implementation of the new instruments that are set up at EU level, notably the Renewable Energy Financing Mechanism[16] and the renewable energy window of the Connecting Europe Facility[17].

[14] A study on the cooperation mechanism and their implementation can be found at: https://energy.ec.europa.eu/cooperation-between-eu-countries-under-res-directive-0_en

[15] For 2020, the joint support schemes resulted in statistical transfers of 50.84 GWh from Denmark to Germany and of 2644 GWh from Sweden to Norway.

[16] https://energy.ec.europa.eu/topics/renewable-energy/financing/eu-renewable-energy-financing-mechanism_en.

[17] https://energy.ec.europa.eu/topics/renewable-energy/financing/financing-cross-border-cooperation_en.

4.4. Measures taken to achieve the 2020 national renewable targets[18]

As set out under Article 27(b) Governance Regulation (EU) 2018/1999, Member States were required to provide specifically information on measures taken to achieve the 2020 national renewable energy targets, including on **support scheme measures**, **guarantees of origin (GO)** , and the **simplification of administrative procedures** .

4.4.1. Support scheme measures

RES-E Sector

In the **RES-E sector**, different combinations of support schemes have been implemented in the Member States according to their reports in recent years. Among the support schemes used to support RES-E generation were **feed-in premiums (FIP)**[19], often combined with **auctioning systems**, quota systems, tax incentives, net metering, subsidies, loans, and feed-in tariffs were also used to support RES-E generation. While the support schemes provided differ per Member State, almost all Member States have at least two support schemes that provide specific support to different technologies, plant sizes, and actors.

A general trend is the **transition from administratively set feed-in tariffs (FIT) towards feed-in premium schemes** that facilitate a higher market integration of renewables. Moreover, support is provided more often following competitive auctions. 19 Member States have implemented auctions for RES-E support until 2020. This trend continued also after 2020: Belgium (2021) and Romania (2022) launched auctions for wind and solar projects and 4 other Member States are also considering introducing auctions for RES-E support[20].

---

[18] Based on the "Assessment of Member States' reports for the year 2020", which included submitted Member State reports as well as reports from the previous project "Technical assistance in realisation of the 5th report on progress of renewable energy in the EU", European Commission, Directorate-General for Energy, Horváth, G., Schöniger, F., Zubel, K. et al., Technical assistance in realisation of the 5th report on progress of renewable energy in the EU : task 1-2 : final report, Publications Office, 2020, https://data.europa.eu/doi/10.2833/325152 .

[19] In a FIP, renewable energy is sold on the electricity spot market and producers receive a payment on top of the market price (source: Feed-in Premiums (FIP) - energypedia). While under a fixed FIP the received premium is independent from the market price and thus remains constant, sliding FIP schemes pay out varying premiums depending on the development of the market price, calculated based on the difference between market prices and a reference electricity price (source: Feed-in Premiums (FIP) - energypedia). If the sliding FIP is allocated through an auction, projects bid on a total remuneration level (€c/kWh) and the premium is determined ex-post, based on the reference electricity prices (source: FIP, fixed or sliding - AURES II (aures2project.eu). A Contract for Difference (DfDs) is a special case of a sliding FIP, in which both positive and negative deviations from a fixed reference price are paid out. It entitles the beneficiary to a payment equal to the difference between a fixed 'strike' price and a reference price – such as a market price, per unit of output (COM (2022/C 80/01); source: What is a contract for difference? (next-kraftwerke.com)).

[20] https://taiyangnews.info/tenders/romanias-950-mw-renewables-tender/ .

In addition to FITs and FIPs, all Member States (except for Latvia) **implemented complementary fiscal measures**, including subsidies, loans, and tax credits/exemptions, to encourage the deployment of RES technologies. These fiscal measures ranged from investment subsidies to loan programs for RE power plants. Most fiscal measures focused on a specific technology, e.g. Germany's support financing programme for offshore wind farms which started already in 2011, or the grant scheme of the installation of net-metering PV systems in residential buildings in Cyprus.

Moreover, in 2020, Member States supported the deployment **of smaller-scale RES-E systems in homes and communities.** For instance, in this year, Belgium, Denmark, Lithuania, Hungary, the Netherlands, Poland, Greece, Italy, Cyprus and Latvia had net metering support schemes for prosumers in place.

Several Member States introduced **new RES-E support schemes in 2020**: For example, Portugal conducted an auction for PV and PV plus storage to allocate a feed-in-premium and investment grants. Malta completed a competitive bidding scheme for feed-in-tariffs for RES installations between 400kWp and less than 1 000kWp. Italy has put in place a legal framework for energy communities and collective self-consumers that allows end users/producers to join together to share locally generated electricity.

RES-T Sector

In the RES-T sector, the most noticeable trend in 2020 is the growing implementation of **fiscal support schemes** that target the uptake of electric or plug-in vehicles directly, e.g. through tax exemptions, direct subsidies or bonuses to the purchase of electric vehicles, or support the development of charging infrastructure.

In 2020, Greece, the Netherlands, Spain and Hungary introduced support schemes that promote e-mobility, primarily by offering subsidies to the purchase of electric vehicles. Spain implemented a support programme called MOVES II which includes support to encourage the purchase of electric vehicles and the installation of charging infrastructures. The SPP subsidy scheme introduced in the Netherlands provides subsidy options for consumers that want to buy fully electric cars for private use. Hungary launched a tendering system for electric vehicles in which individuals and companies can apply for different levels of support for the purchase of an electric vehicle. Greece introduced a law that provides tax incentives to promote the purchase of electric vehicles.

Besides the increasing support to electric vehicles and sustainable mobility, the predominant support scheme for RES-T in the EU continues to be a **quota obligation for renewable fuels**. In 2020 all countries in the EU use an obligation scheme, predominantly a quota, as the main support scheme to increase the share of RES-T. While the quota schemes differ in detail, they all require fuel suppliers to supply a certain proportion of renewable fuels or to use renewable fuels to reduce the average greenhouse gas emission intensity of transport fuels. The required shares are generally increasing year by year, and often targeted a 10% share by 2020.

RES-H&C Sector

Overall, fewer support schemes have been implemented in the RES-H&C sector than in the RES-E sector. Member State support is primarily focused on investment support, either through subsidies or loans. In 2020, 22 Member States provided investment support in the form of subsidies, 12 Member States used (in addition or instead of subsidies) loans to support the deployment of RES-H&C technologies.

The existing support instruments generally apply to a wide range of technologies, but most support goes to heat production from biomass. Other commonly supported technologies include geothermal, aerothermal, and hydrothermal heat pumps, as well as solar thermal systems. In addition to promoting the adoption of RES-H&C technologies, Member States' support schemes also focus on energy conservation and energy efficiency measures.

In 2020, some Member States, including Hungary, the Netherlands, Denmark, Finland and some Austrian regions, have introduced new RES-H&C support schemes, focusing primarily on improving the energy efficiency of homes and installing heat pumps.

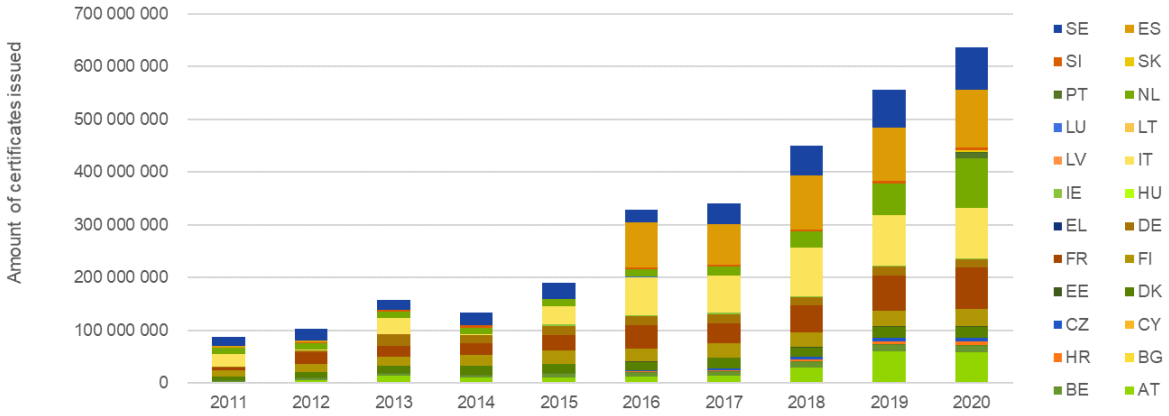
4.4.2. Guarantees of Origin

As specified by the Recast of the Renewable Energy Directive (Directive (EU) 2018/2001) (RED II), Guarantees of Origin (GOs) have the purpose of demonstrating to final consumers the share or quantity of energy from renewable sources in a determined supplier's energy mix and in the energy supplied to consumers under contracts. Member States shall ensure that the origin of energy from renewable sources can be guaranteed as such within the meaning of the Directive, in accordance with objective, transparent and non-discriminatory criteria.

Overall, the number of GOs issued have been steadily increasing since 2011[21]. Some Member States presented a faster growth in GOs, for example, Spain went from a 3%-share of total GOs issued in EU-27 in 2011 to 17% in 2020. Austria, evolved from 2% in 2011 to 9% in 2020, and France moved from 7% to 12% in 2020.

[21] Early adopters in 2011 were Austria, Belgium, Denmark, Finland, France, Germany, Italy, Luxembourg, Netherlands, Portugal, Slovenia, Spain and Sweden.

Figure 11. Annual issuing of GO certificates per country. Source: AIB Statistics[22].



Article 19 of RED II prescribes furthermore that Member States shall ensure that when a producer receives financial support from a support scheme, the market value of the guarantee of origin for the same production is taken into account appropriately in the relevant support scheme. Therefore, Member States have different ways to account for supported electricity and, in general, different ways to set their GO systems.

Based on the technical assistance report[23], some Member States issue GOs also to supported renewable energy. This is the case for Greece, Finland, the Netherlands, Czechia, Estonia, Cyprus, Lithuania, Poland, and Romania. For instance, in Cyprus "issuing of GOs to RES producers is independent of any support received, e.g. investment support or feed in tariff premium. Revenues from GOs will thus be an additional benefit to producers. Producers have to get approval from RES Fund for trading GOs".

A second approach is not to issue GOs to supported electricity, or to issue GOs but cancelling them right away. Belgium, Germany, Spain, Ireland, Malta, Austria, and Slovenia. In Austria for example, GOs are issued for supported and non-supported renewable energy, but only the GOs from non-supported renewable energy plants can be traded internationally, whereas supported GO must be used for Austrian disclosure purposes[24].

Third, Member States can opt for issuing GOs to supported renewable energy but these GOs are centrally auctioned to compensate for the support costs. In this category we find Italy, Luxembourg, France, Portugal, Croatia, Slovakia, and Hungary. For example, in Italy, GOs for

[22] Original data source, AIB statistics https://www.aib-net.org/facts/market-information/statistics . Collected and analysed by Guidehouse.

[23] Technical assistance report "Assessment of Member States' reports for the year 2020" [DOI 10.2833/12592] by Guidehouse Germany GmbH, published on 7 October 2022. The study is contracted by the European Commission.

[24] https://www.aib-net.org/facts/national-datasheets-gos-and-disclosure.

supported renewable energy have been auctioned since 2013. The revenues accrued from the auctions are used to compensate the cost of the supported renewable energy.

4.4.3. Simplification of administrative procedures

RED II established requirements for the Member States to streamline and simplify administrative procedures. Although RED II had to be transposed only by 30 June 2021, some Member States already had a number of such simplification measures in place in 2020 or earlier.

According to their reporting, 10 Member States have set up some sort of **one-stop-shop approach or national contact point**. For example in Finland, the Centre for Economic Development, Transport and the Environment (ELY Centre) of South Ostrobothnia has been designated as the contact point for the permit-granting process for the whole territory in 2020. The contact points shall, upon request by the applicant, guide through and facilitate the entire administrative permit application and granting process. The applicant shall not be required to contact more than one contact point for the entire process. The permit-granting process shall cover the relevant administrative permits to build, repower and operate plants for the production of energy from renewable sources and assets necessary for their connection to the grid[25].

In a few cases the lack of reply of the administration by a deadline leads to **automatic approval of permits**. For instance, the Netherlands' have put rules in place for permits for physical aspects stating that "the deadline for the decision-making process under the standard procedure is 8 weeks, which may be extended once by further 6 weeks at most. Missed deadline will automatically result in issue of a permit (under the principle of lex silencio positivo)"[26].

Some Member States have in place specific renewable energy **spatial planning measures**, such as maps indicating areas where RES could be developed. Such spatial planning can help reduce opposition from local communities and civil society organisations and address the issue of land scarcity. For instance, Spain elaborated two maps for wind and solar power, which classifies land into 5 environmental sensitivity classes for each type of project analysed (maximum, very high, high, moderate and low). However, the maps are only informative and do not replace the necessary administrative steps, such as the need for an Environmental Impact Assessment[27].

The situation regarding **online application** procedures and digitalisation of documents is mixed across the EU. While a few Member States already offer reliable and broad online procedures, most Member States only started to introduce more digital tools to ease the process.

Most Member States have implemented some sort of **simplification for small-scale projects**, such as solar PV installed in rooftops to facilitate self-consumption and energy communities. In

[25] https://www.finlex.fi/fi/laki/alkup/2019/20190126.
[26] https://www.eclareon.com/de/projects/res-simplify.
[27] https://www.eclareon.com/en/projects/res-simplify.

addition, 15 Member States adopted a simplified notification procedure for grid connections of small-scale installations.

4.5. Best practice examples

Looking at the successful Member States, a few lessons can be drawn for the coming decade:

- A stable **political** context, with predictability of support schemes, auction schedules and available budget, provides stakeholders with investment predictability.
- **Putting a price on carbon** and pollution in addition to the EU ETS is also key to allow renewables to compete on an equal footing. Sweden as the country with by far the highest RES share in transport with almost 32% introduced a carbon tax already back in 1991. Also Lithuania levies a general tax on environmental pollution with an exemption for the use of biogas, solid and liquid biomass for heating uses. This, together with other support measures, e.g. for biogas, have led to a high share of renewables in the heating and cooling sector (50.4% in 2020).
- **Swift permitting procedures**, including those set out in RED II and the REPowerEU proposal to amend RED , are essential to speed up the deployment of renewables to the levels needed to achieve the revised 2030 target and hence reduce dependence from Russian fossil fuels. **Single contact points** for project promoters are one important element to facilitate and expedite administrative procedures[28]. For instance, in the Netherlands key permits can be bundled together following a one-stop-shop approach called "All-in-one Permit for Physical Aspects"[29]. The one-stop shop is through an online platform and there is only one responsible authority. On the other side, as recommended by the European Commission in the REPowerEU plan, Member States should designate **dedicated "go-to-areas" for RES** with shortened and simplified permitting processes[30]. Some Member States have in place similar measures, such as maps indicating areas where RES could be developed, but with limited effect as they are not linked to a dedicated regulatory framework leading to faster permit granting. For instance, the Spanish national government published two maps for wind and solar power, which show the territory classified into five environmental sensitivity classes for each type of project analysed (maximum, very high, high, moderate and low). More examples of good practices in this area can be found in the Commission guidance on speeding up permit-granting procedures for renewable energy projects.
- **Increasing public acceptance** of energy policies and projects are key to ensure a successful and sustained energy transition. This includes early involvement of citizens

[28] Under RED II, this has become an obligation for all Member States.

[29] https://www.eclareon.com/en/projects/res-simplify.

[30] https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131.

and possibly also financial incentives such as those e.g. created in Denmark[31]. The above-mentioned guidance provides further examples.

- The use of waste-based biofuels[32] can contribute in a sustainable way towards to the **decarbonisation of transport**, in particular in modes that are difficult to electrify, together with Renewable Fuels of Non-Biological Origin. RED II sets a 3.5% target for the share of advanced biofuels in 2030. Since 2016, the EU consumption has more than doubled to 1 224 ktoe in 2020. The lead Member States in this transition is Sweden with 3.6% share of Annex IX A, followed by Estonia, Finland, Italy, and The Netherlands, which were all above 1% in 2020.
- While a substantial increase in deployment of renewables usually takes time, **dedicated policy actions can yield quick results**. For example, in 2020, Ireland only had one community-owned wind farm. Since then, it has taken energy community focused actions driven by the Renewable Electricity Support Scheme and the Community Enabling Framework, resulting in the successful application of 17 new energy community projects which are benefiting from end-to-end support (financial support and capacity building services) including to develop and operate the project. Actions include a community-dedicated auction for operational support, the set-up of an energy community fund, and a dedicated annual grid connection process.

5. CONCLUSION

By achieving the 2020 targets at EU-level and for all but one Member State, the RED I framework proved to be successful in delivering the envisaged increase in the consumption of energy from renewable energy sources. However, it is clear that, in order to achieve the new REPowerEU target of 45% proposed by the Commission, a steep increase in the deployment of renewable energy will be required - almost a tripling of the average annual increase of 0.8 percentage points over the last decade.

Urgent and full transposition of the 2018 Renewable Energy Directive RED II is key for the success of the energy transition since it lays the foundation of a wider rollout of RES. The Commission is currently checking the transposition and has launched infringement procedures against all Member States, which are at different stages. Moreover, adoption and implementation of the revision of RED II - and its accompanying sectoral measures - will be key for target achievement in 2030. The Commission's proposal of 18 May 2022 aims at removing significant barriers to the successful deployment of RES by simplifying and shortening permit-granting procedures. The Commission therefore calls on the European Parliament and the Council to

[31] The scheme comprises a compensation scheme for citizens whose properties' value has decreased due to the installation of a wind farm; a community benefit scheme to promote local nature restoration projects or the installation of renewable energy sources in public buildings; and the possibility of co-ownership, which allows local citizens to purchase shares from wind energy project, see http://aures2project.eu/wp-content/uploads/2019/12/AURES_II_case_study_Denmark.pdf.

[32] Feedstock included in Annex IX of the Renewable Energy Directive.

adopt the proposal by the end of 2022 so it can enter into force as soon as possible. Moreover, Member States should include in their NECP update drafts, foreseen for 2023 national contributions in line with the 45% EU-wide target proposed by the Commission.

It is still too early to make forecasts as regards the potential 2030 target achievement for the EU as a whole or for individual Member States. First estimates suggest that in 2021, the EU-wide renewable energy share only increased slightly (22.2-22.4%), indicating that the growth in renewable energy consumption was approximately at the same level as the growth in final energy consumption linked with the economic recovery when COVID measures were eased or lifted[33].

Overall, some positive developments could be observed in several sectors recently, indicating that the deployment of renewable energies is progressing. In the electricity sector, early indications suggest that 2022 will be a record year for the European solar PV market with annual deployment growth in the largest EU Member State markets between 17-26%[34]. In the transport sector, the latest quarterly report shows a 53% year-on-year growth in battery electric vehicles[35]. In the buildings sector, the latest market reports show for 2021 a rapid jump in the sales of air-to-air heat pumps at European level, increasing by 34%[36]. In Finland, 75,000 heat pumps were sold during the first six months of 2022, an increase by 80 % compared with the same period last year[37]. In the industry sector, 2021 saw a record year for corporate renewable power purchase agreements (PPAs) with around 6.7 GW of new contracts signed[38].

Several Member States have already made ambitious 2030 pledges, such as for an 80% RES-electricity share in Germany and even 100% in Austria and Estonia. Portugal brought its 80% RES-electricity target forward by four years to already 2026. Moreover, the Netherlands almost doubled their 2030 offshore target 11.5 GW to 21 GW.

[33] Estimations which are not validated by the Commission can be found in EEA Report No 10/2022 (https://www.eea.europa.eu/publications/trends-and-projections-in-europe-2022) and Eurobserver Press Release '2021 RES shares estimates' (https://www.eurobserv-er.org/download-press-releases/).

[34] Global Market Outlook For Solar Power 2022-2026 - SolarPower Europe.

[35] quarterly_report_on_european_electricity_markets_q1_2022.pdf (europa.eu).

[36] 2021_heat_pump_market_data_launch.pdf (ehpa.org).

[37] https://www.sulpu.fi/record-high-sales-growth-of-80-recorded-for-heat-pumps-in-the-first-six-months-of-the-year-in-finland/.

[38] (SWD (2022) 149 final).