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WHITE PAPER

Europe's Green pledge: Can zero-emissions really be achieved?

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The EU aims to become the first climate-neutral continent by 2050. To deliver this, the initial pledge is for a 55% reduction in carbon emissions by 2030.

The goal is to achieve a fully integrated energy system throughout all member states, which delivers climate neutrality using renewable technologies.

The energy sector is responsible for more than 75% of the EU's current greenhouse gas emissions, making it an obvious place to start looking for reductions. Renewable energies produce minimal emissions and strongly figure in EU plans and strategies.

It also is THE industry of the moment, providing plenty of opportunities for the sector.

The EU definitely has its eyes on the prize, and we at Auxadi fully support their efforts, but let's take a quick look around the EU and see how it's going so far.

Austria

Austria got a new government in 2020, and they're committed to achieving zero-emissions by 2040—ten years before the EU deadline. They also have a target of a 100% renewable electricity supply by 2030.

And they're well on the way, already being a global leader in renewables with strong investment in R&D and coordination at the federal and local levels.

The new government plans to add to Austria's already expansive hydropower portfolio (which provided circa 60% of the total energy generated in 2018), to achieve a total goal of 27 TWh by 2030—which means hydro would account for almost 85% of total electricity generated.

Belgium

With just over 10 million inhabitants, a high dependence on its service sector (constituting +80% of GDP in 2018) and a strong dependence on foreign energy production, nuclear energy has played an important role in Belgium's energy mix. For the future, though, Belgium is betting on wind and hydro renewables.

Belgium already has a good gas transport infrastructure, but its emergency oil stock is also high. About half of Belgium's current electricity generation is nuclear. Yes, it's fossil-fuel free, but definitely can't be considered green.

The current policy is to close all nuclear power plants between 2022–2025. To fill the energy void, the government plans to expand its natural gas and renewables generation, and enhance energy connections with neighboring countries.

Bulgaria

Bulgaria only started adjusting its legal and regulatory framework for renewables in 2007—far later than its EU cousins. That said, Bulgaria's renewables share has increased dramatically since, mostly in wind and solar. In 2009, just two years later, they pledged to increase their wind power capacity tenfold by 2020, reaching 3 GW cumulative. By 2020, Bulgaria were producing 701 megawatts (MW) of installed capacity with primary wind energy, 1,043 MW of solar, 3,204 MW of hydroelectric and 78 MW of biomass energy.

In 2019, Bulgaria pledged for 27% of their total energy to come from renewables by 2030, using wind, solar and others. 14% of their current energy requirements are hydro, but they still have some nuclear plants.

That same year, the Bulgarian Minister of Agriculture, together with the Ministers of Agriculture of the Czech Republic, Slovakia and Poland, issued a joint declaration published by the Council of the European Union in which they specified "the importance of the use of renewable energy sources of agricultural and forestry origin in the EU with the aim of improving energy security and the environmental, economic and social sustainability of Europe".

Croatia

Croatia's on course, with 28% of its total energy consumption currently coming from renewables. Most of this is hydro, but Croatia has made great investment in wind, and opportunities abound for investment in solar.

According to a recent study by the Energy Institute Hrvoje Požar, 32% of total energy consumption will come from renewables by 2030, and +56% by 2050. This will require an annual investment of USD40-50million.

But investment incentives are plentiful. Half of Croatia's energy consumption is imported, and the EU Green Deal will partially fund renewables investment, but isolated regions offer great opportunities. The state-owned electrical energy company is building a wind farm and solar farm in Korlat, but more is needed, and requested by Croatian businesses—who have seen a 30% rise in in prices in the last few years.

Cyprus

The island currently depends on imported oil but cost reductions in renewable tech and abundant renewable energy sources provide ample opportunity to reduce dependence on fossil fuels.

According to Eurostat data collected by ICEX, 8.4% of the energy produced in Cyprus was renewable in 2016 (up from 6% in 2010).

Cyprus plans to increase its renewable energy share to around 23% before 2030, through a planned interconnection with Greece and Israel.

This would imply an annual growth of around 7-10%, which places Cyprus as one of the countries that, comparatively speaking, will develop the renewables sector the most during this decade.

We're guessing that photovoltaic and wind power industries could play an important role in the coming years.

Czech Republic

In 2020, 11% of the Czech Republic's energy production came from renewable sources, with coal and nuclear still playing a prominent role in the energy mix.

With this in mind, the Republic recently approved a new National Energy Policy (SEP) aiming to reduce consumption and improve energy intensity, laying out key targets for energy security, emissions, electricity generation, energy savings, and affordability. However, great effort will be needed to reach the targets laid out.

The Czech Republic has had recent strong growth in solar PV, but policy changes and uncertainty about SEP have seen a steep decline in installations. The energy sector is dominated by coal, which produces most of the country's emissions and dramatically affects local air quality. In addition, the country has a large dependence on fuel imports.

Denmark

Denmark is making great strides towards the EUs zero-emissions target and is thoroughly committed to renewables–indeed in December 2020 the government voted to bring an immediate end to oil & gas exploration and phase out fossil fuel production by 2050. Previously the biggest fossil fuel producer in Europe with 55 wells over 20 fields, Denmark's decision has been lauded worldwide.

The country has also struck a deal to construct an artificial island to produce renewable energy. Expected to power circa 3 million homes, it will also provide power to the neighboring countries of Belgium, The Netherlands and Germany. Construction is expected to begin in 2026. The Danish government will hold a 51% stake in the island but are opening the remainder to the private sector.

Estonia

Estonia's energy supply is dominated by oil shale, which gives a very high carbon intensity along with energy independence. In 2018, oil shale constituted 72% of Estonia's total energy production, and 76% of generated electricity.

Estonia is required to reduce emissions, rather than merely containing their growth.

In summer 2020, the country announced an offshore wind farm project with Latvia in the Gulf of Riga. If this becomes a reality, it would go a long way to help reduce Estonia's dependence on Russian-generated electricity, attract investment and potentially reduce electricity prices.

In summer 2020, Estonia announced an offshore wind farm project with Latvia in the Gulf of Riga

Finland

Like its Scandinavian cousins, Finland is a world leader in renewable energy—particularly bioenergy (fuels from forestry side streams and wood-based fuels, and heat generated from biodegradable waste). Finland has also invested in hydro, wind and ground heat collection.

Renewables provide 40% of the nation's energy, and the goal is to raise this to 50% by 2030. Corporate energy buyers are flocking to Finland's attractive PPA system and windy conditions.

In fact, its potential in renewables may go even further. As ICEX reports in its Country Guide document: "[Finland] wants to increase installed wind capacity, which is now at 500 MW and they want it to reach 700 MW. There may be complications, not because of lack of will but because the opposition of those affected to having wind farms in their surroundings is increasing. But the sector has potential, especially now that Finland, Sweden, Norway and Denmark have strengthened the electricity interconnection system, known as Nordigrid".

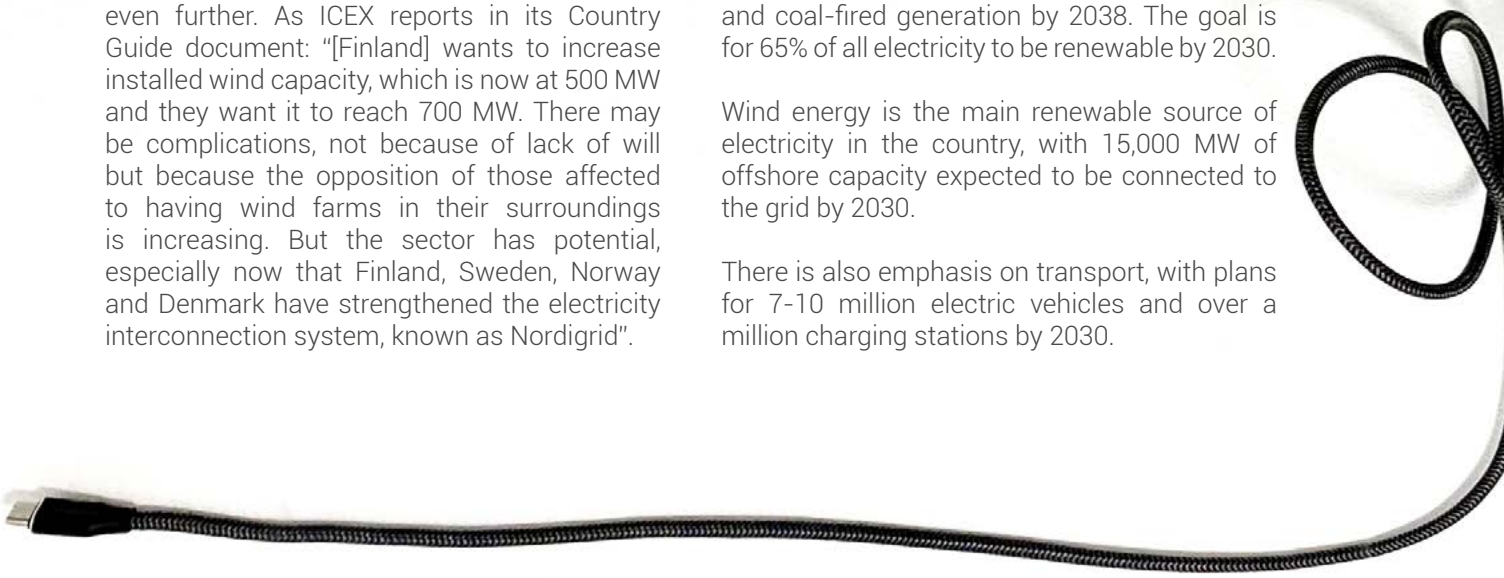
Germany

Germany's commitment to the climate transition is clear. In 2016, it established an ambitious plan known as Energiewende, through which it stated its aims to cover the majority of its energy needs with renewables and reduce greenhouse gas emissions, as well as recommending abandonment of nuclear energy.

Then Germany launched its Climate Protection Package 2030, outlining a major plan to transform energy efficiency using renewables. This provides a clear strategy to 2050, which includes a reduction in nuclear power by 2022, and coal-fired generation by 2038. The goal is for 65% of all electricity to be renewable by 2030.

Wind energy is the main renewable source of electricity in the country, with 15,000 MW of offshore capacity expected to be connected to the grid by 2030.

There is also emphasis on transport, with plans for 7-10 million electric vehicles and over a million charging stations by 2030.



France

France has a low-carbon electricity mix from its nuclear program, but many reactors are reaching the end of their lifetime. So begins an ambitions energy transition program, guided by the Energy and Climate Change Law 2019, which lays out a national strategy, carbon budgets, and plans a framework for energy investment, including subsidy-free PPAs.

France plans to reduce the nuclear share of electricity production from 75% to 50% by 2035. They're well on the way, securing strong power prices and awards of 1.4 GW for wind and solar developers in its latest auction, with plans to tender 28 GW of wind and solar by 2026.

> France plans to reduce the nuclear share of electricity production from 75% to 50% by 2035

Greece

Greece is currently implementing major energy sector reforms to foster competitive markets, create opportunities and support the transformation to sustainable renewables. The country has seen a credible increase in the renewables share of electricity generation—solar targets have been more than achieved.

The plan now is for renewables to supply 35% of energy consumption and 61% of total power demand by 2030. The government is implementing reforms passed late in 2020 which, among other reforms, will enable generators and private offtakers to structure power purchase agreements–something not previously available.

Measures will also be taken related to simplify the RES (Renewable Energy Sector) licensing procedure and improve the country's grid.

Hungary

Hungary's National Energy Strategy to 2030 aims to ensure a sustainable and secure energy sector while supporting competitiveness.

Renewable energy production has increased significantly in the last decade, but sector growth has now slowed. Recent reforms and support for renewable electricity could arrest this slowdown, however, there are measures in place that limit wind power developments.

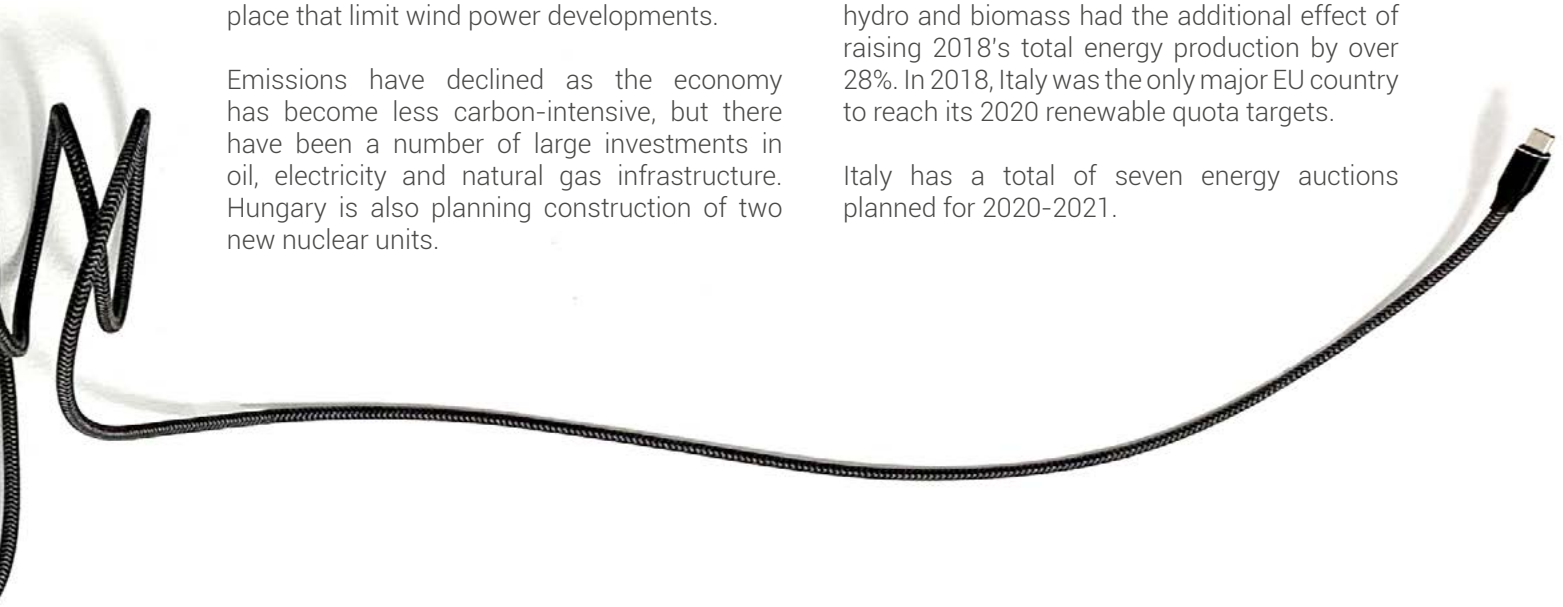
Emissions have declined as the economy has become less carbon-intensive, but there have been a number of large investments in oil, electricity and natural gas infrastructure. Hungary is also planning construction of two new nuclear units.

Italy

Italy produced its National Energy Strategy in 2013, setting clear goals to reduce energy costs, meet environmental targets, strengthen energy security and foster economic growth. But this was only the first step to achieving their ambitions.

The Italian energy strategy greatly promotes renewables. Indeed, investments in wind, solar, hydro and biomass had the additional effect of raising 2018's total energy production by over 28%. In 2018, Italy was the only major EU country to reach its 2020 renewable quota targets.

Italy has a total of seven energy auctions planned for 2020-2021.



Ireland

Ireland's wind-based energy production is impressive, and it has improved its domestic gas production and reduced oil-based energy.

The government recently announced a new Renewable Electricity Support Scheme, and will be holding auctions to help reach its target of 70% of Ireland's total electricity sourced from renewables by 2030.

E&Y's RECAI notes that the Irish Government would like corporate PPAs to provide 15% of renewable demands by 2030.

> The Irish Government recently announced a new Renewable Electricity Support Scheme

Latvia

According to ICEX's Economic and Trade Report (Dec 2020), Latvia's consumption of renewable energy sources has increased by 16.7% in the last 5 years. Gross energy consumption in Latvia has decreased in the last ten years and its composition has changed in favor of a greater weight of renewable energy, to the detriment of natural gas.

Latvia currently produces slightly more than 40% of its annual energy consumption from renewable energy, with hydro taking 97% of total renewable production. The remaining 3% is divided between wind and biomass.

Latvia is yet to fully capitalize on wind and solar tech, but its emissions are the lowest in Europe—both in total emissions and emissions per capita.

Lithuania

After the declaration of independence in the early 1990s, Lithuania's sectors has been changing, adapting to an international and interconnected context, and proving sectors such as trade and transport as strategic for the country. This doesn't prevent other industries (such as the oil industry) from continuing to play an important role.

Lithuania is heavily dependent on energy imports, after losing its energy independence in 2009 when the nuclear plant, *Ignalina*, was decommissioned. New legislation outlined plans to reduce imports and achieve 38% energy independence by 2025, with full independence by 2050.

Lithuania is ripe for large scale deployment of renewable energy resources. According to information from the trade guide prepared by ICEX, "The Ministry of Energy awarded in January 2020 the first renewable energy auction, for an amount of 300 GWh. This auction is part of the auctions planned for the period 2019-2023, whose ultimate goal is to have Lithuania producing 5 TWh with renewable energies by 2025. In parallel, a program for the development of photovoltaic energy in residential buildings and industries has been launched, to promote self-consumption, which will receive aid in the amount of 4.5 million euros".

Luxembourg

Luxembourg faces problems achieving its energy sector targets. Low energy prices are a barrier to needed investment in renewables. The country has a fossil fuel intensive energy mix, driven by a high demand for transportation fuels from freight and commuters. (A high percentage of workers in Luxembourg live in neighboring countries and commute.)

Heavily linked to the European electricity market, security of supply is a priority and Luxembourg plans to expand renewables generation and electricity grids. The government's plan to introduce gradually increasing carbon pricing in 2021 could also stimulate the changes and investments required for the transition to a low-carbon energy system.

Luxembourg faces problems achieving its energy sector targets

Lithuania's new legislation outlined plans to reduce imports and achieve 38% energy independence by 2025, with fully independence by 205

Malta

Malta is a country of contrasts. With a surface area of just over 300 km^2, its GDP shows a high percentage weight of sectors such as commerce or public administration, as well as the manufacturing or energy sectors.

Malta's renewable energy market is mainly photovoltaic, boosted by a number of initiatives. The use of solar water heaters and obliging importers to introduce biofuels have helped Malta increase its share of renewable energy.

The government recently announced the approval of 54 million euros of European Union funds to invest in the energy sector, earmarked for energy efficiency and renewable energy projects, with the expectation of funding 3,000 different initiatives.

> New legislation outlined plans to reduce imports and achieve 38% energy independence by 2025, with fully independence by 2050

Poland

Coal features heavily in Poland's energy supply; it's the largest source of Poland's greenhouse gas emissions, but also a major employer. However, the country has experienced strong growth in renewable energy over the past decade.

According to the draft Energy Policy of Poland to 2040, the share of coal in electricity generation will be reduced from just under 80% in 2017 to 60% by 2030. The policy also places priority on long-term energy security, has a strong emphasis on reducing greenhouse gas emissions and air pollution, increasing energy efficiency, and decarbonizing the transport system. Nuclear power could play a significant role, as the country is planning its first nuclear plant.

While the Polish energy infrastructure has been modernized, further investments are needed to strengthen integration with neighboring markets.

The Netherlands

The Netherlands is a hub for Europe's global energy trade through its open market and integrated supply chains. The Netherlands is a heavy user of fossil fuel and is CO2-intensive. However, the outlook for Europe's second-largest producer of natural gas is challenging, with declining production and uncertain prospects. Looking to 2050, Netherlands has set targets for 100% of its electricity to come from renewable sources.

It has developed a detailed offshore wind roadmap, easing permit procedures and aiming for 11.5 GW of total installed capacity by 2030. R&D efforts are also being made for carbon capture, renewable hydrogen production and sustained cost reduction of offshore wind and other renewable technologies.

The Netherlands is also investing heavily in innovative sectors such as Smart Cities, with significant related implications for the renewable energy sector.

Portugal

Portugal is a world leader at integrating generation from wind and solar PV and has pledged targets of 80% renewable electricity by 2030, and a carbon neutral economy by 2050.

Renewables met 60% of Portugal's power demand in the first half of 2020, led by hydro with 28% and wind with 23%, says a report by Portuguese power utility, REN. Photovoltaics (PV) contributed 2.6%, and biomass 7%.

Portugal has also embraced energy auctions—the most recent of which (Aug 2020) included a storage component. As a result, at least 100 MWh of energy storage will now be deployed in Portugal by 2024. Through 2021 and beyond, the government hopes to hold two energy auctions per year, awarding a total capacity of 1 GW per annum.

> Renewables met 60% of Portugal's power demand in the first half of 2020

Romania

Romania invested heavily in renewables in the early 2000s, with support schemes and tax breaks effective for the 15 years following. The surge in renewables this caused let Romania meet its targets for 2020. However, no renewable energy production has been put into operation since 2017 (apart from very small solar parks).

In April 2020, the share of green energy in the total production of electricity was just under 50%. Wind energy represented 17.38% of the total delivered to the grid, solar energy 2.63%, hydro 29.67% and biomass energy 0.24%.

Romania wants to achieve a quota of +30% for renewable energy within the total energy mix by 2030, and is expected to launch PPAs and other helpful schemes.

Slovakia

Slovakia is embarking on the path of energy transformation towards planet-friendly means of production, though its current heavy dependence on nuclear energy and underutilization of renewables may make this difficult.

Approximately 54.7% of the total energy production in Slovakia was from nuclear power stations, 21% from conventional power stations, with just 14.4% from hydro and 8.9% from other renewable sources—which makes it ripe for renewable energy investment.

By 2030, the country has set a target of reducing greenhouse gas emissions by 12%, increasing the share of renewable energies in the energy mix to 19% and improving energy efficiency.

The Ministry of Economy solicits bids for renewable energy production. All successful bidders will receive feed-in premium payments on top of the wholesale electricity price under 15-year PPAs.

In short: Slovakia presents a significant investment opportunity for the renewable energy sector, particularly at the industrial level.

Spain

See the separate document (coming soon).

Sweden

Sweden, like its Nordic cousins, leads the way towards a low-carbon economy. With targets set in the Energy Agreement and Climate Framework, Sweden aims to become a net-zero carbon economy by 2045. It also pledges 100% renewable electricity generation by 2040 and reducing transport emissions by 70% from 2010 to 2030. There is no doubt their carbon taxation levels (some of the highest in the world) will contribute to these goals.

Sweden uses a very low share of fossil fuels in its primary energy supply, thanks to large scale hydro, nuclear and, in recent years, wind power investment. Space heating is also supplied with mainly low-carbon energy sources, owing to the wide use of bioenergy-based district heating and electric heat pumps.

Conclusion

Almost all of the EU Member States have made, and are still making, great strides towards the zero-emissions by 2050 goal.

Given EU society's awareness of climate change and carbon neutrality, populations are in general agreement with the plans and are giving renewable energy projects their support.

There are still a few countries who could benefit from boosting their renewable energy provisions but, on the whole, we are betting that the EU will achieve carbon neutrality.

And the world will be better for it.

If you're looking to expand your business within the EU, Latin America or the U.S.—maybe you're looking to capitalize on renewable energy sector opportunities—Auxadi can help. We can create SPVs and assist in domiciliation, provide directors and paralegal assistance, then take over the day-to-day, non-value functions of accounting, reporting, tax and even payroll.

And our unique and customizable MultiCountry IT platform guarantees the same processes producing the same output across your global locations—providing smooth automated processes, easy access to your data, and consolidated information to help your decision-making.

At Auxadi, we make life easier for our clients.

For further information on Renewable Energy development and deployment within the EU:

- The European Commission's Energy division
- The International Renewable Energy Agency
- The International Energy Agency

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