

# Decarbonized Energy System

Sustainable Governance Indicators 2024



Indicator **Policy Efforts and Commitment to Achieving a Decarbonized Energy System by 2050**

Question **How committed is the government to fully decarbonizing the energy system by 2050?**

30 OECD and EU countries are sorted according to their performance on a scale from 10 (best) to 1 (lowest). This scale is tied to four qualitative evaluation levels.

- 10-9 = The government is clearly committed to transitioning to a decarbonized energy system.
- 8-6 = The government is largely committed to transitioning to a decarbonized energy system.
- 5-3 = The government is somewhat committed to transitioning to a decarbonized energy system.
- 2-1 = The government is not at all committed to transitioning to a decarbonized energy system.

## Finland

Score 9 According to the IEA (2023), Finland has established one of the most ambitious climate targets globally, legally committing to achieving carbon neutrality by 2035 as mandated by the updated Climate Change Act of July 2022. The act sets binding targets to reduce greenhouse gas emissions by 60% by 2030, 80% by 2040 and 90% to 95% by 2050, excluding land use changes.

Substantial progress has been made toward this goal, marked by the deployment of Europe's first new nuclear reactor in over 15 years and a significant expansion of wind energy generation. As a result of these advancements, Finland boasts the second-lowest proportion of fossil fuels in its energy supply among IEA members. Finland is actively decreasing its dependence on Russian energy imports, enhancing energy security by augmenting imports from other nations, increasing domestic renewable energy production and improving overall energy efficiency.

Despite considerable achievements in the fields of clean energy and energy security, notable challenges persist. Imported fossil fuels still constitute more than a third of the energy supply, and certain sectors of the Finnish economy, such as transportation and key industrial activities, continue to rely on fossil fuels. Additionally, land use change and forestry, which have traditionally acted as a substantial offset for greenhouse gas emissions, became a net source of emissions for the first time in 2021.

The National Climate and Energy Strategy (NCES) outlines Finland's plan to achieve carbon neutrality, emphasizing nuclear energy, renewable electricity, heat

production, energy efficiency and electrification. Energy efficiency, especially in industry, is crucial. Finland aims to increase renewable energy deployment, particularly from onshore wind and solar plants. The focus is also on developing and commercializing new energy technologies for sectors in which decarbonization is difficult. Finland intends to enhance its role in the global battery supply chain, utilizing its significant deposits of critical minerals.

Finland aims to reduce reliance on Russian energy imports, increase energy security and decrease natural gas use. Energy efficiency measures, electrification and renewable energy growth are pivotal, along with reductions in the amount of oil consumed in the transport sector. The electricity sector – dominated by nuclear energy – plays a vital role, and Finland is investing in low-carbon generation. Peat's role is diminishing, and efforts are being made to reduce its usage.

The strategy and road map to facilitate the transition toward a fully decarbonized energy system by 2050 are included in the National Climate and Energy Strategy, which has clearly defined targets. The strategy is binding as it relates to climate targets expressed in law. There are political consequences if targets are missed. However, it is not clear what the consequences would be for ministers.

As explained above, the overall strategy has been broken down into sector-specific action plans, which are aligned with the overall targets. The only policies that undermine the goal of a decarbonized energy system include subsidies to peat production; however, there are plans for phasing out peat production.

Public procurement is not currently a topic of discussion in connection with the energy transition strategy.

Citation:

IEA. 2023. Finland 2023 Energy Policy Review. Paris: OECD Publishing. <https://doi.org/10.1787/d435fa51-en>

## France

### Score 9

Decarbonization of the energy production sector has been identified as one of the main targets for France's green transition. The Paris Climate Agreement's targets are viewed as the government's primary commitments in this regard. France still figures among the developed countries with comparatively low levels of carbon emissions per capita. Yet the composition of the energy mix has not changed much in the last decade. The share of fossil fuels is still 47% (2021), which means France is dependent on imported fossil fuels. Progress with regard to developing renewable sources is slow – rising from an 8% share of the overall mix in 2011 to 13% in 2021 (European Commission 2023).

A number of sectors have developed plans both to reduce energy needs and to produce emissions-free energy. In the construction sector, renovations that improve

structures' insulation receive significant subsidies. In transport, a large-scale plan for long-term investment in the train infrastructure launched in 2023. This links the modernization and development of the infrastructure with the aim of decarbonizing transport. According to one plan, only electric and hydrogen cars will be sold by 2025. Emitting industries have their own plans to build carbon-capture systems and to electrify processes. The centerpiece of the French strategy is the development of nuclear plants able to produce electricity without carbon emissions. Shale oil extraction has been banned within the national territory, but imports are still allowed. Renewable energy is promoted, but with far less priority than nuclear energy. Nonetheless, the French electricity system is almost carbon-free.

The overall strategy for the reduction of carbon emissions is largely shared across the government, with the Ministry for the Economy being as active in this domain as the Ministry of Ecological Transition. These policies are seen as highly political measures, with direct and regular interventions by the prime minister and the president himself.

Progress toward decarbonization is closely and regularly monitored at the governmental level, and the results are publicized (MEE 2023).

Citation:

MEE. 2023. "Mise à jour des indicateurs de suivi de la PPE." [https://www.ecologie.gouv.fr/sites/default/files/Publication%20Indicateurs%20PPE%20pour%202021\\_Janvier%202023.pdf](https://www.ecologie.gouv.fr/sites/default/files/Publication%20Indicateurs%20PPE%20pour%202021_Janvier%202023.pdf)

European Commission. 2023. "State of the Energy Union 2023 France." Retrieved 28 January 2024 from [https://energy.ec.europa.eu/document/download/1ce7abfa-4ac8-49b2-a0c8-05667db92f81\\_en?filename=FR\\_SoEU%20Fiche%202023\\_New.pdf](https://energy.ec.europa.eu/document/download/1ce7abfa-4ac8-49b2-a0c8-05667db92f81_en?filename=FR_SoEU%20Fiche%202023_New.pdf)

## Spain

Score 9

In December 2020, Spain adopted the Integrated Energy and Climate Plan (ENCP) 2021–2030, which includes measures on both mitigation and adaptation. The long-term goal of the plan is to make Spain carbon neutral by 2050, achieve a 90% reduction in GHG emissions from 1990 levels, and base the electricity system exclusively on renewable sources by 2050. In May 2021, the Climate Change and Energy Transition Law was passed, establishing specific national targets for 2030 and detailed measures to fulfill these objectives. For instance, financial resources and environmental and energy sustainability criteria must be incorporated into all public procurement in a cross-cutting and mandatory manner.

The overall strategy is broken down into sector-specific action plans, such as The Self-consumption Roadmap and The Renewable Hydrogen Roadmap. In December 2022, the Council of Ministers approved the Strategic Project for Economic Recovery and Transformation, focusing on the industrial decarbonization of sectors like non-metallic mineral products, the chemical industry, oil refining, metallurgy, and paper manufacturing.

The Ministry for the Ecological Transition and the Demographic Challenge (MITECO) is responsible for the vertical and horizontal coordination and implementation of these strategies. Since early 2022, autonomous communities must report on their energy and climate plans, detailing measures adopted and planned in line with the Spanish Energy Transition Law's objectives.

As part of the RRP, the government moved its 2025 energy transition targets forward to 2023 and increased investments, with almost 40% of these investments earmarked for the ecological transition. The European Commission assessed the implementation of the 2023 targets as "well under way" (European Commission 2023).

Citation:

Law 7/2021 of 20 May

European Commission. 2023. "Country Report – Spain." Brussels. SWD(2023) 609 final. [https://economy-finance.ec.europa.eu/system/files/2023-05/SWD\\_2023\\_609\\_1\\_EN\\_autre\\_document\\_travail\\_service\\_part1\\_v4.pdf](https://economy-finance.ec.europa.eu/system/files/2023-05/SWD_2023_609_1_EN_autre_document_travail_service_part1_v4.pdf)

## Denmark

Score 8

In 2020, the Danish government passed a Climate Law that set a target in which Denmark is to cut emissions by 70% relative to the 1990 level by 2025, and attain climate neutrality by 2050. The law requires the minister of environment to review the plan every five years and propose a new target to be reached in the coming five years. The new plan cannot be less ambitious than the preceding one, according to the law. Additionally, the law stipulates that: "The achievement of Denmark's climate goals must be as cost-effective as possible, taking into account both the long-term green transition, sustainable business development and Danish competitiveness, healthy public finances and employment, and that Danish business life must be developed and not wound down."

The Danish energy sector is moving toward decarbonization. The Agency for Energy monitors energy production and consumption in Denmark and publishes monthly and yearly reports. According to the agency, Denmark is among the world leaders in using and implementing decarbonization technologies.

As part of the Climate Law, an independent climate council has been set up to monitor policy and provide recommendations to the government. The council consists of climate experts and has its own secretariat. The council produces a yearly report that reviews various climate initiatives and assesses the progress made. The report is required to be sector-specific and offer recommendations to policymakers.

The Climate Council finds it unlikely that the target for reductions by 2025 can be achieved. The most recent report suggests two main obstacles to meeting the targets set out in the Climate Law. The first is the absence of a plan for carbon and climate reductions in the agricultural sector. According to the Climate Council, agricultural

production should be subject to a climate tax. The Climate Council also argues that such a tax might conflict with the terms of the law, and notes considerable risks that the targets will not be met if the tax is not introduced. Additionally, the Climate Council expresses concern that the text on industrial production is insufficient due to changes in the overall taxation of companies.

Finally, it should be noted that the consequences of failing to meet the targets set in the Climate Law are unclear, as is the responsibility for such failures.

The government has faced criticism for not taking sufficient action to meet the targets outlined in the Climate Law. In 2022, a broad political compromise was reached to introduce a CO<sub>2</sub> tax for all firms, excluding those in the agricultural sector. This tax – differentiated based on whether companies are within the EU Emissions Trading System or not – will take effect in 2030. An expert committee is currently analyzing the feasibility of a CO<sub>2</sub> tax for the agricultural sector.

Citation:

Climate law:

<https://www.retsinformation.dk/eli/lt/2020/965>

Climate Council report 2023:

<https://klimaraadet.dk/da/rapport/statusrapport-2023>

## Germany

### Score 8

With a score of 68.3 on a scale from 0 to 100, Germany ranks 18th out of 115 countries on the 2021 Energy Transition Index. This places Germany above the world average of 59.35, making it a leading country in the energy transition. The country's transition readiness is scored at 69.2 points, placing Germany ninth (World Economic Forum, 2021).

In general, the Federal Ministry for Economic Affairs and Climate Action (BMWK) is responsible for energy policies. It is currently working on developing a system development strategy (Systementwicklungsstrategie) that will function as a cross-sectoral strategy for transforming the energy system. In November 2023, the BMWK published a progress report on the strategy. The report suggests that the strategy will define robust transformation paths and focus on the industry, building, and transport sectors while also covering energy supply and infrastructure (BMWK, 2023).

Although Germany does not yet have an overarching strategy for transforming its energy system, the government has formulated specific goals for the energy sector. Measures to achieve these objectives are included in other existing programs and plans.

First, the Federal Climate Change Act (Klimaschutzgesetz) sets legally binding greenhouse gas (GHG) emission targets for individual sectors, including the energy sector. For 2030, the emission volume is set at a maximum of 108 million tons of

CO<sub>2</sub>-equivalents, representing a 77% reduction compared to 1990. These emission goals are continuously monitored. If the sector does not meet its emission target, the responsible ministry must develop and implement an immediate program with measures to meet the required target (Umweltbundesamt, 2023).

Second, measures to reach these targets are outlined in the Action Plan 2050 (Klimaschutzplan 2050) and the Climate Protection Program 2030 (Klimaschutzprogramm 2030), which specify multiple actions to achieve climate neutrality. For example, the Climate Protection Program 2030 includes the gradual reduction and eventual end of coal-fired power generation. Onshore wind energy is also to be expanded, specifically by accelerating planning procedures, involving local citizens at an early stage, and improving the permit situation (BMU, 2019).

Third, through the adaptation of the Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz, EEG), a primary target for the energy sector is to increase the share of renewable energy sources to a minimum of 80% by 2030, supporting the measure of significantly scaling back fossil-based energy. To achieve this, a set of immediate measures was adopted by the parliament in 2022, including actions such as accelerating the planned expansion of onshore wind turbines (BMWK, 2024).

In 2022, Germany had electricity production capacities – the maximum amount of power that can be generated – of 66,163 megawatts for wind energy, 10,974 megawatts for hydro energy, and 1,592 megawatts for energy from solid biofuels. The wind energy capacity was particularly notable, increasing from 33,477 megawatts in 2013. Germany's wind energy capacity is the highest among countries in the Euro area. For wind energy, Germany ranked sixth and fourth for solid biofuel energy. Germany also had the highest solar energy capacity in the Euro area in 2020, with 53,671 megawatts (Eurostat, 2024a).

Finally, due to a lack of specific information, no informed statement can be made on whether the government monitors the effective implementation of policies if the implementation is delegated or whether it can intervene if the implementation is endangered.

Citation:

BMU. 2019. "Klimaschutzprogramm 2030 der Bundesregierung zur Umsetzung des Klimaschutzplans 2050." <https://www.bundesregierung.de/resource/blob/974430/1679914/c8724321decefc59cca0110063409b50/2019-10-09-klima-massnahmen-data.pdf?download=1>

BMWK. 2023. "Zwischenbericht der Systementwicklungsstrategie." [https://www.bmwk.de/Redaktion/DE/Publikationen/Energie/20231122-zwischenbericht-der-systementwicklungsstrategie.pdf?\\_\\_blob=publicationFile&v=11](https://www.bmwk.de/Redaktion/DE/Publikationen/Energie/20231122-zwischenbericht-der-systementwicklungsstrategie.pdf?__blob=publicationFile&v=11)

BMWK. 2024. "Das steckt im Osterpaket." <https://www.bmwk-energiewende.de/EWD/Redaktion/Newsletter/2022/04/Meldung/topthema.html>

Eurostat. 2024a. "Electricity production capacities for renewables and wastes." [https://ec.europa.eu/eurostat/databrowser/view/NRG\\_INF\\_EPCRW/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/NRG_INF_EPCRW/default/table?lang=en)

Umweltbundesamt. 2023. "Treibhausgasminderungsziele Deutschlands." <https://www.umweltbundesamt.de/daten/klima/treibhausgasminderungsziele-deutschlands#nationale-treibhausgasminderungsziele-und-deren-umsetzung>

World Economic Forum. 2021. "Fostering Effective Energy Transition 2021 Edition." <https://www.weforum.org/publications/fostering-effective-energy-transition-2021/in-full/rankings>

## Greece

### Score 8

Greece has a clearly defined strategy and roadmap for transitioning to a fully decarbonized energy system by 2050. This strategy is outlined in the national reform program (Hellenic Republic 2023) and the “Greece 2.0” Recovery and Resilience Plan agreed upon with the EU (Greek Government 2023). The strategy is binding, supported by legislation from the Ministry of Energy and Environment, and adopted by the Greek parliament.

The strategy is implemented through sector-specific action plans, such as the “National Action Plan for Energy and Climate” (Ministry of Energy and Environment 2019) and the “Green Transition Pillar” of the “Greece 2.0” plan (Greek Government 2023). Notable policy measures include the government’s goal to phase out coal-powered electricity by 2028, despite ongoing lignite mining, and to reduce total greenhouse gas emissions by 55% by 2030 (International Trade Association 2023). These policies represent an aggressive shift away from fossil fuels to meet the EU’s 2050 decarbonization target.

Greece’s progress is supported by both public and private investments, with significant contributions from Greek and foreign firms in high and low-voltage grid operators and natural gas distribution. Greece leads the EU in electricity production capacity from wind power and is among the top performers in hydroelectric capacity relative to GDP (Eurostat 2023 and IMF 2023). Public procurement in the energy sector is regulated and monitored by the independent Hellenic Single Public Procurement Authority (EADHSY).

The Ministry of Energy and Environment leads these efforts, while regional governments manage regional projects under close central government oversight. Central units consistently monitor, update, and publish policy measures annually (e.g., Ministry of Energy and Environment 2023).

In summary, while Greece remains above the OECD average in primary energy consumption per capita (BP 2022) and CO<sub>2</sub> emissions from fuel combustion per capita (IEA 2023), it has made significant strides in renewable energy adoption. In 2019, Greece ranked below the OECD average in terms of renewable energy share of total final energy consumption in the SDGs. Greece’s renewable energy consumption increased from 15% in 2013 to 23% in 2022, nearly reaching the EU average (Eurostat 2022).

#### Citation:

BP Statistical Review of World Energy. 2022. 71st Edition. <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-full-report.pdf>

Eurostat. 2022. “Share of renewable energy consumption.” [https://ec.europa.eu/eurostat/databrowser/view/nrg\\_ind\\_ren/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/nrg_ind_ren/default/table?lang=en)



Eurostat. 2023. “Electricity production capacities for renewables and wastes.” [https://ec.europa.eu/eurostat/databrowser/view/NRG\\_INF\\_EPCRW/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/NRG_INF_EPCRW/default/table?lang=en)

Hellenic Republic. 2023. “National Reform Programme 2023.” April. <https://commission.europa.eu/system/files/2023-05/Greece%20NRP%202023.pdf>

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IEA. 2023. “GHG Emissions from Energy 2023, Highlights.” <https://www.iea.org/data-and-statistics/data-product/greenhouse-gas-emissions-from-energy-highlights>

IMF. 2023. “World Economic Outlook October 2023, Gross domestic product, current prices, USD.” <https://www.imf.org/en/Publications/WEO/weo-database/2023/October>

International Trade Administration. 2023. “Greece – Country Commercial Guide – Energy.” <https://www.trade.gov/country-commercial-guides/greece-energy>.

Ministry of Energy and Environment. 2019. “National Action Plan for Energy and Climate.” <https://ypen.gov.gr/energeia/esek/>

Ministry of Energy and Environment. 2023. “Annual Action Plan 2023.” [https://ypen.gov.gr/wp-content/uploads/2023/01/%CE%95%CE%A0%CE%99%CE%A4%CE%95%CE%9B%CE%99%CE%9A%CE%97\\_%CE%A3%CE%A5%CE%9D%CE%9F%CE%A8%CE%97\\_%CE%95%CE%A3%CE%94\\_2023\\_%CE%A5%CE%A0%CE%95%CE%9D.pdf](https://ypen.gov.gr/wp-content/uploads/2023/01/%CE%95%CE%A0%CE%99%CE%A4%CE%95%CE%9B%CE%99%CE%9A%CE%97_%CE%A3%CE%A5%CE%9D%CE%9F%CE%A8%CE%97_%CE%95%CE%A3%CE%94_2023_%CE%A5%CE%A0%CE%95%CE%9D.pdf)

SDG. 2019. “Sustainable Development Goals Indicators Database Indicator 7.2.1, Series: Renewable.” energy share in the total final energy consumption (%),” <https://unstats.un.org/sdgs/indicators/en/>

The website of the public procurement authority (EADHSY) is <https://www.gov.gr/en/sdg/public-contracts/reporting-irregularities/competent-administrative-authorities-for-submission-of-complaints/hellenic-single-public-procurement-authority-hsppa/>

The website of the Ministry of Energy and Environment is <https://ypen.gov.gr/>

## Latvia

### Score 8

Latvia designated and adopted a “Strategy for a Decarbonized Economy by 2050” in 2018. Several medium-term white papers and government regulations support the strategy. Overall, the legal framework and strategic vision are clearly elaborated. The strategy is divided into sector-specific plans for the medium term, with government regulations for the transport sector, construction, forestry, and the energy sector, including electricity, heating, and renewables.

High energy costs in the winter of 2022 – 2023 pushed the government to make several strategic decisions – to provide financial support for residents as a short-term solution and to support renewable energy in the long term. According to Eurostat, in 2021, the share of energy from renewable sources was 42.10%. The trend shows that the share of renewable energy is increasing while the share of fossil fuels is decreasing. About 48.4% of Latvia’s territory is covered by forests, a significant natural resource. Thus, timber is widely used for heat.

The Ministry of Climate and Energy was established in January 2023 to prioritize climate change, decarbonize the economy, and promote renewable energy. Because

Latvia has a well-established policy-planning system, implementation progress is monitored annually through various tools, including public and government progress reports.

Citation:

Informatīvais ziņojums “Stratēģija Latvijas oglekļa mazieltīpīgai attīstībai līdz 2050. Gadam” (in Latvia). [https://www.varam.gov.lv/sites/varam/files/varaminf\\_110718\\_omastrategija2050\\_majaslapa.pdf](https://www.varam.gov.lv/sites/varam/files/varaminf_110718_omastrategija2050_majaslapa.pdf)

Eurostat. 2023. “Share of Energy from Renewable Sources.” [https://ec.europa.eu/eurostat/databrowser/view/nrg\\_ind\\_ren/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/nrg_ind_ren/default/table?lang=en)

Central Statistical Bureau. 2023. “Statistics in Brief. Latvia 2023.” <https://stat.gov.lv/en/statistics-themes/economy/national-accounts/publications-and-infographics/15176-latvia-statistics>

## Lithuania

Score 8

The government is largely committed to transitioning to a decarbonized energy system. In Lithuania, the National Energy Strategy adopted in 2018 has been the main strategic document in this field. This document includes targets for increasing the share of renewable energy. There is also a Law on Renewable Energy. In 2019, the National Energy and Climate Action Plan for 2021 – 2030 was adopted. The program of the current government, adopted in late 2020, sets the target of having 30% of energy produced by renewables by 2025 and increasing this share to 50% by 2030. According to the strategy, by 2050 Lithuania should be a climate-neutral country with a fully circular economy. A significant share of decarbonization-related investments are planned and are already being funded through the New Generation EU facility.

In 2022 – 2023, there has been an acceleration of wind and solar energy projects that could mean the targets will be reached earlier than planned. As noted in the report on Lithuania’s energy system transformation to 2050, presented in late 2023, there was a “sixfold increase in solar and twofold increase in wind capacity over the past few years” (DNV 2023). According to the European Commission’s 2023 country report on Lithuania, the country “has adopted a new legislative framework to improve institutional and legal mechanisms to promote the generation, transmission and consumption of electricity from renewable sources. This measure will improve the Lithuanian energy market by establishing a new framework for the sale of electricity and setting long-term renewable energy targets for all sectors. This will contribute to the development of renewable energy sources in Lithuania.”

The drive to increase the share of renewables was initially motivated by geopolitical concerns and the need to reduce reliance on supplies from Russia. More recently, however, it has been driven by optimism about technological progress, which projects significant potential for wind and solar-powered energy as well as the production of green hydrogen. Major energy sector companies envision that the development of renewable energy offers Lithuania an opportunity to become a regional hub. This would support the growth of a new generation of sustainable industry with a strong demand for green energy, which would allow the country to

serve as a hub for exporting not only energy, but also carbon-free products and e-fuels across Europe.

Citation:

Ministry of Energy. "Information on Renewable Energy." <https://enmin.lrv.lt/en/sectoral-policy/renewable-energy-sources/legislation-2/>

Ministry of Finance. "New Generation Lithuania (in Lithuanian)." <https://finmin.lrv.lt/lt/es-ir-kitos-investicijos/naujos-kartos-lietuva>

The Seimas. 2020. Resolution on the Program of the Eighteenth Government of Lithuania, No. XIV-72.

European Commission. 2023. "Country Report: Lithuania." [https://economy-finance.ec.europa.eu/publications/2023-country-report-lithuania\\_en](https://economy-finance.ec.europa.eu/publications/2023-country-report-lithuania_en)

DNV. 2023. "Lithuania Energy System Transformation to 2050." EPSO-G Energy System Transformation Strategy.

## Netherlands

Score 8

Looking at past policy performance through 2021 in the area of transitioning to a decarbonized energy system, the Netherlands is a laggard or a mid-tier player. Renewable energy accounted for 15% of total energy consumption in 2022. In 2021, it was 13%. Energy consumption per person in the Netherlands fell to 154 gigajoules in 2022, the lowest level since 1970. This is mainly because people consumed less gas due to the war in Ukraine.

The Netherlands was 77% dependent on energy from abroad in 2022. This percentage had not reached this level since the State Mines opened in Limburg in 1906. Energy consumption per capita was highest between 1995 and 2010, and has been declining since 2013 despite population growth as homes and cars became more fuel-efficient. Milder winters have also played a role. Especially after the Russian invasion of Ukraine, energy prices rose sharply. As a result, people consumed less energy for fear of high bills. Since then, energy prices have dropped significantly.

The transition to renewable energy has been an incremental one. Generally speaking, the intention is to use energy more economically; to shift from coal-generated electricity to solar and wind power; to shift from natural-gas-based heating systems to sustainable heat such as geothermal heat, residual heat and green hydrogen; to involve local residents by giving them the opportunity to participate in or co-own local energy projects; and to smartly integrate energy projects into the environment and landscape. The Netherlands generates renewable energy mainly via offshore wind turbines, wind turbines on land, and solar panels on roofs and in solar parks. In the future, technologies such as geothermal heat, residual heat and green hydrogen will be added. The government is also committed to the use of nuclear energy.

As part of its neoliberal policies, the central government encourages companies to invest in renewable energy production. The government also stimulates the use of sustainable energy by private individuals. For example, more and more homes are giving up the use of gas. The Dutch are also increasingly engaging in energy-saving measures and generating sustainable energy at home. There is a subsidy for

individuals who want to generate sustainable energy using a heat pump or solar water heater. A national subsidy for solar panels is being phased out, but there are other financial programs in place.

For Minister of Energy and Climate Rob Jetten, just facilitating these market developments appeared too slow. He argued that companies were not making enough headway in the area of sustainability, which is why the government began becoming “more proactive than we have seen in decades.” Jetten presented the National Energy System Plan (NPE) in January 2023. This plan sketches the contours of the energy system of the future. It also discusses the path toward realizing this system, and how citizens, businesses, co-governments, state-owned companies, grid managers and other stakeholders can help shape the system.

The plan entails a vast monitoring system that includes:

- Annual monitoring: The House of Representatives is informed annually by the cabinet about the progress of the energy system and the realization of individual plan elements within the NPE.
- Annual energy memorandum. The Energy System Monitor and the Climate and Energy Foresight Exploration (KEV) are then used as inputs for the Energy Memorandum. In this document, the government assesses the progress made in the past year compared to the intended (interim) results looking toward 2050.
- Five-year review and update: The NPE will be updated in its entirety at least every five years. This is in line with the cycle laid down in the Climate Act for the adoption of the Climate Plan and the EU obligation to submit an integrated national energy and climate plan (INEK) to the European Commission.

Realizing such an integrated energy system will require new partnerships. A good example is the Regional Energy Strategies (RES) system. Within the context of the RES, governments work with the social partners, grid operators, business and, where possible, residents to develop regionally supported choices. Municipalities are tasked with making a democratically legitimized final decision. Of course, implementation risks are legion. Strong opposition is likely from carbon energy-dependent businesses and citizens unwilling to pay higher energy prices or who are resisting investments in energy-saving devices. Moreover, feasibility already proving to be a bottleneck, with long project lead times, lengthy decision-making processes, and disputes between public and private initiatives. Shortages of required technical personnel and the financing needed for the transition are added complications.

Citation:

Rijksoverheid. Nationaal Plan Energiesysteem definitief vastgesteld.  
Nieuwsbericht | 01-12-2023

NRC, Chris Hensen and Erik van der Walle. 2023. “Bij de vergroening van het Nederlandse energiesysteem neemt de overheid een ongebruikelijk dominante rol in.” NRC, July 3.

CBS. 2023. “Hernieuwbare energie in Nederland 2022.” 12-10.

NOS Nieuws. 2023. “Energieverbruik per inwoner terug op niveau van 1970.” October 10.

van Dijk. 2023. “De overheid van Rob Jetten (D66) oogt repressief, regentesk en koud.” HP/De Tijd April 19.

NRC, Erik van der Walle. 2022. “Wijkverwarming Gemeenten willen zelf eigenaar zijn van warmtenetten, maar dat zien energiebedrijven niet zitten. De minister zoekt een uitweg.” September 28.

## Portugal

Score 8

Portugal’s energy system is recognized as one of the most decarbonized within the European Union. By 2022, the country had successfully phased out coal from its energy mix and embarked on an ambitious path to secure 80% of its electricity from renewable sources by 2026. This would outpace its initial target by four years.

The strategic direction of Portugal in this area is guided by three pivotal documents: the Roadmap for Carbon Neutrality 2050, the National Plan for Energy and Climate 2021 – 2030, and the Climate Law (Lei 98/2021). These frameworks outline Portugal’s overarching strategy, which is further delineated into sector-specific objectives. The primary focus areas are energy, transportation, and industry, with explicit emission reduction targets set for 2030 and 2050.

Portugal’s energy portfolio features a renewable energy composition of 32%, significantly above the European Union average of 19%. To promote the shift toward renewable energy, the country has implemented various policies, including tax exemptions, subsidies, and quotas, with specialized incentives for the agricultural sector. While the adoption of renewable energy technologies is higher than average, the extent of tax exemptions is comparatively modest.

Within this framework, Portuguese energy policy establishes a clear foundation for achieving a fully decarbonized system by 2050.

Citation:

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Lei de Bases do Clima. 2021. Diário da República n.º 251/2021, Série I. <https://dre.pt/web/guest/pesquisa/-/search/170291204/details/maximized>

## Slovenia

### Score 8

The Slovenian government has adopted several documents addressing energy from renewable sources. The National Action Plan for Renewable Energy initially aimed for renewable sources to constitute at least 25% of total energy consumption by 2020. This target was later increased to 27% by 2030 under a new document adopted by a subsequent government.

In 2023, Slovenia submitted its strategic draft of the Integrated National Energy and Climate Plan to the EU, making it one of six countries to submit on time. This plan outlines targets, strategies, and measures for the five dimensions of the Energy Union up to 2030, with a perspective extending to 2040. These dimensions are: 1. Decarbonization, 2. Energy efficiency, 3. Energy security, 4. The internal energy market, and 5. Research, innovation, and competitiveness.

Created in collaboration with various stakeholders, the document includes sectoral target shares of total energy consumption: 41.4% for heating and cooling, 43.3% for electricity, and 20.8% for transport. Additional targets were set for other sectors as well.

Despite Slovenia's comprehensive energy and climate policy measures, policymakers acknowledge the need for improvements and additional actions to achieve the established targets. To address these issues, the Law on the Promotion of the Use of Renewable Energy Sources was adopted in 2021, followed by the Law on the Siting of Plants for the Production of Electricity from Renewable Energy Sources in 2023. According to the International Energy Agency, the carbon intensity of industrial energy consumption in Slovenia decreased from 40.9 to 33.8 gCO<sub>2</sub> per MJ between 1990 and 2020. For instance, final coal consumption for households dropped from 6,022 TJ in 1991 to 1 TJ in 2021, and industry consumption decreased from 5,183 TJ in 1990 to 881 TJ in 2021.

Regarding low-carbon electricity generation, nuclear energy accounts for the largest share, followed by hydropower, with biofuels, solar energy, and wind energy comprising smaller shares. Notably, solar energy surpassed biofuels in 2019 and generated 645 GWh in 2022. Total CO<sub>2</sub> emissions decreased by almost 10% between 1990 and 2021, despite significant increases from 1995 to 2013.

Slovenian policymakers, like those in some other European countries, believe nuclear energy can play a crucial role in achieving decarbonization targets. There have been numerous debates about constructing a second unit at the Krško nuclear power plant, with calls for a referendum on the issue. At the beginning of 2024, all parliamentary parties advocated for a referendum on this matter.

Citation:

European Commission. 2024. "Slovenia – Draft Updated NECP 2021 – 2030." [https://commission.europa.eu/publications/slovenia-draft-updated-necp-2021-2030\\_en](https://commission.europa.eu/publications/slovenia-draft-updated-necp-2021-2030_en)

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Partnerstvo za trajno gospodarstvo. 2024. "<https://cer-slo.si/6-drzav-je-pravocasno-oddalo-osnutke-nacionalnih-energetska-podnebnih-nacrtov-03-07-2023.html>"

## Sweden

### Score 8

Environmental policy surfaced on the political agenda in the 1970s, coinciding with the establishment of the Environmental Party [Miljöpartiet De Gröna]. Since then, environmental issues, including energy transitions, have remained prominent. With its history as a high-energy-consuming industrial economy, Sweden undoubtedly faces significant challenges, but it has set ambitious goals for emissions reductions. Much of this effort occurs at the urban level.

Energy issues fall under the jurisdiction of the Swedish Energy Agency and the Swedish Environmental Protection Agency. Both public agencies have developed detailed plans for a sustainable energy transition. The Swedish Energy Agency released its 2025 – 2028 strategic priorities in research and innovation, which include technology and sustainable value chains for energy transition, accelerated transition through system demonstrators and business development for accelerated energy transition, a resilient and robust energy system, increased competence for energy transition, governance, and conflicting objectives and pathways for the energy system (Energimyndigheten, 2024). The agency places a pronounced emphasis on renewable energy sources.

In the restructuring of the funding agencies, research funding for the Swedish Energy Agency is discontinued. About 30% of electricity production is generated by nuclear plants – six reactors in three plants, currently planned to run until 2040 (Strålsäkerhetsmyndigheten, 2024). The current government is planning to further expand nuclear plants.

Sweden aims to be carbon neutral by 2045. The Swedish Environmental Protection Agency has a detailed plan with constituent targets to achieve this goal (see <https://www.sverigesmiljomal.se>). These targets are non-binding but are part of the climate framework, which includes legislation, goals, and an advisory board that lend significant political weight to the issue (Naturvårdsverket, 2023). However, the current right-wing government tends to have a more permissive attitude toward climate issues.

Citation:

Energimyndigheten. "Strategic priorities in energy research and innovation 2025-2028." <https://energimyndigheten.a-w2m.se/Home.mvc?ResourceId=219218>

Naturvårdsverket. 2024. "Sveriges klimatmål och klimatpolitiska ramverk." <https://www.naturvardsverket.se/amnesomraden/klimatomstallningen/sveriges-klimatarbete/sveriges-klimatmal-och-klimatpolitiska-ramverk/>

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## Switzerland

Score 8

Currently, two legislative projects are furthering decarbonization. On 18 June 2023, the people voted to approve a new Federal Act on Climate Protection Objectives, Innovation and Energy Security. It enshrines the country's net-zero target of CO<sub>2</sub> emissions into law. "It further defines interim and sectoral targets toward 2040 and 2050, introduces a subsidy scheme to replace heating systems with heat pumps and, as a framework law, it further mandates the creation of measures in several fields connected to climate mitigation and adaptation" (Climate Action Tracker 2023). Article 3 of this law states: "The confederation shall ensure that the impact of man-made greenhouse gas emissions in Switzerland is zero by 2050 (net-zero target) by reducing greenhouse gas emissions as far as possible; and the effect of the remaining greenhouse gas emissions is offset by the use of negative emission technologies in Switzerland and abroad." Article 4 defines actions by sectors (such as traffic, industry, buildings) and Article 5 requires enterprises to reach a point of net-zero emissions by 2050. Article 10 states: "The confederation and cantons act as role models in terms of achieving the goal of net-zero emissions and adapting to the effects of climate change." This law is a framework law, mostly programmatic at this point. The various objectives must be achieved by separate special laws.

The second legislative project is still in the making. It is the so-called CO<sub>2</sub> succession law: "By ratifying the Paris Agreement, Switzerland has committed in a next step to reducing greenhouse gas emissions by at least 50% compared to 1990 by 2030. A total revision of the CO<sub>2</sub> Act was supposed to have defined the measures for achieving this target by 2030. But on 13 June 2021, the Swiss electorate rejected the revised CO<sub>2</sub> Act. Parliament therefore decided on a transitional arrangement. This requires that greenhouse gas emissions be reduced by a further 1.5% annually by 2024 compared to 1990 and continues measures that would have expired at the end of 2021 without such a regulation. For the period after 2024, a new revision of the CO<sub>2</sub> Act is necessary. The Federal Council submitted a new bill to parliament to this end in September 2022" (FOEN 2023).

By December 2023, the respective committees of both chambers of parliament had discussed the bill. On 20 December 2023, the House of Representatives (Nationalrat) indicated its support for the new law in principle, with some differences with regard



to the decisions made by the upper house (Ständerat, Council of States). After the final decision in parliament, the new law will likely be subject to a popular vote (Swiss Parliament 2023).

These laws suffer from the downside of Swiss consensus democracy, which hinders ambitious changes aimed at sustainability transition because of the need to integrate a vast array of players with opposing interests into the policymaking process.

On the one hand, on paper, Switzerland is committed to the decarbonization of its economy by the Federal Act on Climate Protection Objectives, Innovation and Energy Security. The overall strategy is well-developed. On the other hand, this framework law needs to be implemented by various laws. The government is an oversized four-party coalition that must develop compromises among all its constituent political parties, ranging from a very pro-environment Social Democratic Party to a much more skeptical right-populist party, as well as industrial actors. Major decisions are made not only by the parliament, but also via direct-democratic popular votes. Finally, decarbonization strategies must also be supported by the cantons, which can at least modify federal laws in the process of implementation. Hence the notion of a central government able to implement a decarbonization strategy as a coherent policy in a top-down mode is not compatible with the basic institutional setup of the Swiss political system (see also Ingold/Narath 2021: 847-849, Ingold et al. 2016).

Citation:

Bundesgesetz über die Ziele im Klimaschutz, die Innovation und die Stärkung der Energiesicherheit vom 30. September 2022. 2022. BB1 2022 2403. <https://www.fedlex.admin.ch/eli/fga/2022/2403/de>

Climate Action Tracker. 2023. "Climate Action Tracker Switzerland." <https://climateactiontracker.org/countries/switzerland/>

Federal Office for the Environment, Bundesamt für Umwelt. 2023. "FOEN 2023." <https://www.bafu.admin.ch/bafu/de/home/themen/klima/inkuerze.html>

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Ingold, Karin, Eva Lieberherr, Isabelle Schläpfer, Kathrin Steinmann, and Willi Zimmermann. 2016. *Umweltpolitik der Schweiz. Ein Lehrbuch*. Zürich/St. Gallen: Dike.

Swiss Parliament. 2023. "<https://www.parlament.ch/de/ratsbetrieb/suche-curia-vista/geschaefft?AffairId=20220061>, accessed on 2023 12 27"

## United Kingdom

Score 8

The UK government has a strong, legally entrenched commitment to achieving net zero emissions, based on the 2008 Climate Change Act, which established "carbon budgets" for five-year intervals. During Boris Johnson's tenure, a ten-point plan issued in late 2020 outlined a roadmap for a wide-ranging transition towards net zero, including ending the sales of petrol and diesel cars and vans by 2030. As the

host of the 2021 COP26 in Glasgow, the UK was keen to demonstrate leadership in relevant policies.

Recently, some policy adjustments have been made to mitigate the pace of change for certain sources of carbon emissions. Prime Minister Rishi Sunak emphasized that these changes affect the pace of transition in specific sectors without compromising the overall target. In a speech in September 2023, Sunak announced a delay in the target for electric vehicles (EVs) to 2035, citing the slow rollout of charging infrastructure and associated costs. He noted that 80% of new vehicles were still expected to be electric by 2030.

Additionally, the government announced a slower phase-out of gas boilers in favor of heat pumps to ease the burden on households and businesses. However, some policy changes, such as accelerating industrial decarbonization, are expected to offset these less immediate targets. The government also controversially approved a new coalmine in Cumbria, arguing that its output, needed for manufacturing processes, would otherwise be imported at a higher carbon cost. New licenses for oil and gas exploration in UK territorial waters were also issued, motivated by the need for secure gas sources during the transition.

These policy changes faced sharp criticism both domestically and internationally. The independent Climate Change Committee (CCC), established by the 2008 Act to advise the UK and devolved governments on emissions targets and report to Parliament on progress, argued that the changes would make it harder to achieve net zero by 2050. The CCC warned that the uncertainty and potential perception of a weakened government commitment could be damaging. In its June 2023 annual progress report to Parliament, the committee identified risks to meeting the UK's emissions targets, policy gaps, and significant delivery risks. Internationally, the German-based Climate Change Performance Index, which had previously ranked the UK highly, downgraded the UK by nine places to 20th in its 2024 assessment.

One implication of the revised approach is a potential loss of international credibility. Nevertheless, the UK is on track to achieve a 50% reduction in carbon emissions since 1990, the greatest decline among G20 countries. The share of renewables in electricity generation has been increasing rapidly, with offshore wind as the largest component, accounting for a record of just under 50% of electricity generation in the first quarter of 2023. Despite the political challenges, the UK's commitment to net zero remains firm.

Citation:

<https://www.theccc.org.uk/2023/10/12/ccc-assessment-of-recent-announcements-and-developments-on-net-zero/>

<https://ccpi.org/wp-content/uploads/CCPI-2024-Results.pdf>

## United States

Score 8

In 2020, Joe Biden ran for president on the most ambitious climate agenda of any major candidate in U.S. history (Tollefson 2020). In April 2021, Biden set a new national target of reducing emissions by 50% from 2005 levels by 2030 and achieving net-zero emissions by 2050.

Joe Biden has achieved more on the climate transition front than any of his predecessors, particularly due to his landmark Inflation Reduction Act of 2022 and his Infrastructure Investment and Jobs Act of 2021 – commonly known as the Bipartisan Infrastructure Law. Since the enactment of these laws, the United States has seen a surge in clean energy manufacturing (Vangala et al. 2022).

There are encouraging signs of progress (Elder 2021). Over a million electric vehicles were sold in the United States last year, bringing them to nearly 10% of new car sales in the United States. Americans can now access consumer tax credits for electric vehicles. One of the challenges to the expansion of electric vehicles is the lack of chargers. However, the Bipartisan Infrastructure Law provides billions of dollars in subsidies to build 500,000 electric charging points by 2030 under a National Electric Vehicle Infrastructure program (Case 2023). Moreover, the administration has allocated additional funds to maintain the existing chargers.

There are other areas of progress as well. In September 2022, the U.S. Senate ratified the Kigali Amendment on reducing hydrofluorocarbons (HFCs), and the Environmental Protection Agency (EPA) has taken action to phase out HFCs (Tan et al. 2023). In November 2022, the Biden administration released a new Methane Action Plan, which includes \$20 billion in funding to reduce methane emissions from the oil and gas industry. Biden's Inflation Reduction Act (IRA) also taxes methane emissions as a disincentive to firms (Lashof 2024).

While more action is still needed, Biden's administration, in just three years, has achieved far more than any of its predecessors. The administration continues to show strong determination to tackle climate change as part of a bold investment and infrastructure program (Medlock 2021).

### Citation:

Dan Lashof. 2024. "Tracking Progress: Climate Action under the Biden Administration." [https://www.wri.org/insights/biden-administration-tracking-climate-action-progress?utm\\_medium=social&utm\\_source=twitter&utm\\_campaign=socialmedia](https://www.wri.org/insights/biden-administration-tracking-climate-action-progress?utm_medium=social&utm_source=twitter&utm_campaign=socialmedia)

Tammy Tan, Lisa Rennels, and Bryan Parthum. 2023. "The Social Costs of Hydrofluorocarbons and the Benefits from Their Expedited Phase-Down." *Nature*.

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## Austria

### Score 7

Austria has been heavily affected by ongoing climate change. The rise in temperature (+2.3 °C in 2022) was nearly double the global average (Umweltbundesamt 2023), and all serious projections anticipate this trend will continue. This will have significant consequences, particularly in economic terms, with specific impacts on winter tourism in the alpine region.

Austrian governments have been largely committed to transitioning to a decarbonized energy system, although with medium-strong success. Greenhouse gas emissions have remained strikingly high. An official report by the Austrian Federal Audit Office from early 2021 suggests that greenhouse gas emissions grew by 5% in Austria over the past 30 years – making the country one of just six EU member states that have failed to achieve any improvement – while during the same period, the average for all EU member states decreased by 24%. Energy and industry remain the largest contributors to carbon dioxide emissions (Umweltbundesamt 2023). Economic growth and cheap carbon market certificates for carbon dioxide are the principal causes of the increase in carbon dioxide emissions in this sector.

According to an estimate by Wifo-Institut, Austria invested between €4.1 billion and €5.7 billion in climate-damaging subsidies from 2016 – 2020 (Kletzan-Slamanig et al. 2022). During the recent “gas crisis” this amount allegedly rose temporarily to €14.5 billion.

The participation of the Greens in the government formed early in 2020 and the appointment of a Green climate minister have marked a tangible change in Austria’s performance. The ÖVP-Green government launched several ambitious national targets. First, 100% of domestic electricity consumption will be covered by renewable energy sources by 2030. Second, the government is committed to achieving climate neutrality by 2040. Whether the government will achieve these targets remains to be seen. Perhaps the most spectacular measure of the recent past was the introduction of an annual “climate ticket” in late 2021 (for about €1,100), which allows ticket holders to use all forms of public transport (trains, buses, trams and subways) across the country. The pricing of CO<sub>2</sub> emissions, as stipulated in a major tax reform package introduced in late 2021, marked another important step forward.

Furthermore, in late 2023 the government suggested scrapping several subsidies, particularly those for commuters and on diesel. However, no concrete measures have been taken yet.

However, the temptation to compromise on agreed measures has remained a characteristic feature of Austrian energy policy. For example, the fees for CO<sub>2</sub> emissions per ton were set to increase in July 2022, but that increase was postponed

for several months to ease the financial burdens on an inflation-plagued society.

Citation:

Umweltbundesamt. 2023. "Klimaschutzbericht 2023." <https://www.umweltbundesamt.at/fileadmin/site/publikationen/rep0871bfz.pdf>

<https://pureadmin.unileoben.ac.at/ws/portalfiles/portal/9161065/AC16559769.pdf>

[https://www.german-energy-solutions.de/GES/Redaktion/DE/Publikationen/Kurzinformationen/Technologiefactsheets/2023/fs-oesterreich-w%C3%A4rme.pdf?\\_\\_blob=publicationFile&v=1](https://www.german-energy-solutions.de/GES/Redaktion/DE/Publikationen/Kurzinformationen/Technologiefactsheets/2023/fs-oesterreich-w%C3%A4rme.pdf?__blob=publicationFile&v=1)

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## Estonia

### Score 7

The General Principles of Climate Policy (GPCP), which look forward to 2050, were first adopted as a Riigikogu resolution in 2017. Regular updates every four years were established as a part of the GPCP process, and in 2022 the renewed document was adopted with minor changes. As a Riigikogu resolution, the document is binding on the executive. At least once every four years, the government submits a report to the Riigikogu on the progress made in implementing the cross-cutting and sectoral strategies. The first report, which was published in 2022, covered the period 2017 – 2021.

The GPCP 2022 includes an overarching target to reduce greenhouse gas emissions to zero by 2050. It provides sectoral policy guidelines for energy and industry, transport, agriculture, forestry and land use. However, there are no defined indicators for these sectors, meaning ministers who fail to demonstrate progress will not face consequences. The lead agencies are logically the Ministry of Environment/Climate and the Ministry of Economy and Communications, although the GPCP 2022 does not specify any ministries, specific responsibilities or an interministerial coordination mechanism. This omission is because the GPCP functions as a "vision document," with its goals meant to be implemented through various sectoral development plans.

The country's low enforcement capacity is illustrated by the Energy Scoreboard 2021 – 2040, prepared by TalTech University and the Rohetiiger Foundation. This 60-page document includes analysis, models, and some concrete targets and timelines. However, since it is not a government document, it remains only a proposal.

Several sectoral targets are derived from EU documents, such as the goal to achieve the status of zero or near-zero energy consumption (ZEB status) for all buildings by

2050. Estonia is progressing toward this objective, and some categories of buildings, like schools and government buildings, may attain this standard within the current decade. However, detached private houses, many of which are old and lack energy labeling, face greater challenges (Volkova et al. 2023). Interestingly, the Ministry of Economy and Communications is more skeptical about the possibility of meeting the EU ZEB target than are scientists and experts in the field (ERR 17.05.2022).

Citation:

Rohetiiger. 2022. "Energy Roadmap 2021-2030-2040." <https://rohetiiger.ee/valjaanne/energy-roadmap-2021-2031-2040/?lang=en>

Volkova, A et al. 2023. "Estonian Energy Roadmap to Carbon Neutrality." *International Journal of Energy Planning and Management*. <https://doi.org/10.54337/ijsep.7568>

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## New Zealand

### Score 7

While New Zealand does not have a comprehensive roadmap detailing every step toward a fully decarbonized energy system by 2050, successive governments have outlined several strategies and actions contributing to this transition.

The Zero Carbon Act 2019 sets a legally binding commitment to reduce New Zealand's greenhouse gas emissions to net zero by 2050. The act establishes long-term emissions reduction targets and requires regular emissions budgets to achieve these goals. The government's Energy Strategy 2050 aims to reach net zero for long-lived gases by 2050, and sets the objective of generating 100% renewable electricity by 2030 (Ministry of Business, Innovation & Employment 2023). New Zealand has an Emissions Trading Scheme designed to put a price on carbon emissions, incentivizing emission reductions and providing economic signals for transitioning to low-carbon alternatives (Ministry for the Environment n.d.). The government also supports investments in clean energy technology research, development and deployment, including renewable energy projects and innovations in energy storage – for example, through the Government Investment in Decarbonizing Industry (GIDI) fund (RNZ 2023) or through the \$2 billion climate infrastructure fund with U.S. investment fund BlackRock, which was announced in August 2023 (New Zealand Government 2023).

A report published by the International Energy Agency (IEA) in 2023 commends New Zealand for setting ambitious decarbonization targets and highlights that – due to its vast renewable energy resources – the country is in a good position to cut emissions across the economy. However, the report also notes that New Zealand has more work to do in setting clear pathways to meet its objectives (IEA 2023).

Moreover, the 2023 elections and the change in government from Labour to National have thrown the decarbonization targets into doubt. While new Prime Minister Christopher Luxon in principle supports the decarbonization of the economy and has

announced several policy measures to achieve this objective – for example, shortening consent timeframes for renewable energy projects – the National-ACT-NZ First coalition agreement also contains several measures that would undermine decarbonization efforts, such as scrapping the Clean Car Discount and reversing the ban on at-sea oil and gas exploration (Wannan 2023).

Citation:

IEA. 2023. “New Zealand Can Use Its Clean Electricity Strengths to Decarbonise Its Energy System, Says New IEA Report.” <https://www.iea.org/news/new-zealand-can-use-its-clean-electricity-strengths-to-decarbonise-its-energy-system-says-new-iea-report>

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New Zealand Government. 2023. “First of its kind climate fund to back 100% renewable electricity.” <https://www.beehive.govt.nz/release/first-its-kind-climate-fund-back-100-renewable-electricity>

RNZ. 2023. “Government commits extra \$16.2 million to Government Investment in Decarbonising Industry.” 20 April. <https://www.rnz.co.nz/news/political/488370/government-commits-extra-16-point-2-million-to-government-investment-in-decarbonising-industry>

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## Norway

### Score 7

Norway’s per capita electricity consumption is the highest in the world. Households overwhelmingly use electricity, including for cooking and heating, as there is no public residential gas infrastructure. Electricity consumption accounts for approximately half of total energy consumption, a figure that has remained relatively constant since 2010. Total final energy consumption has increased by 17.9% since 1990.

Electricity production in Norway is almost entirely (99%) hydro-based. Electricity dominates energy use in manufacturing, the household sector, and service industries, while petroleum products account for a large proportion of energy use in sectors that make heavy use of transport and machinery. District heating and natural gas account for only a small share of energy use, but this has been increasing in recent years. Consumption of district heating has risen, particularly in service industries and households, while there has been an increase in the use of gas in manufacturing industries and the transport sector. These energy carriers have been replacing fuel oil for heating and coal, coke, and heavier petroleum products in industrial processes. The transport sector causes approximately one-third of Norwegian emissions to air. Other large emitters are the petroleum industry and other energy-intensive industries (approximately 25% each). While most of the petroleum industry and the energy-intensive industries (chemicals, steel, paper, mining) are covered by the EU ETS,

most of the transport sector is not (the exceptions being aviation and marine transport, which will be included from 2024). The government makes a clear distinction between support and intervention in the non-ETS and the ETS sectors.

Norway has worked to reduce emissions in the transport system for 15 years. The first cross-party Climate Agreement from 2008 stipulated that increased transport needs from urbanization should be met through improved public transport, walking, and cycling. Zero-emission vehicles have been targeted by economic incentives, including zero toll, lower taxes, free parking, and the building of charging infrastructure in urban areas. As a result, more than 80% of newly registered personal cars were EVs as of 2023, and EVs constitute just under 25% of the total number of personal cars in 2023.

Despite this increase in zero-emission vehicles, emissions have not been reduced accordingly due to an increase in population and transport activity. The government's Green Book (Climate Status and Plan) from 2023 stipulates that emissions from road traffic will decrease by the required 40% (from 8.7 MtCO<sub>2e</sub> in 2022 to 5.4 MtCO<sub>2e</sub> in 2030) because of the continued increase in zero-emission vehicles, technological developments that will make zero-emission possible for heavier vehicles, and increased use of biofuel.

Discussion about reducing emissions from the petroleum sector primarily centers on using electricity for offshore installations. Currently, about half of these installations use electricity from the national grid. There are plans to extend this to another 10 projects by 2030, indicating a significant increase in electricity consumption by the petroleum sector.

Norwegian energy-intensive industry has been relatively successful in reducing emissions, achieving a 40% reduction in 2022 compared to 1990 levels. Future emission reductions, therefore, will require significant technical developments. Hydrogen is frequently mentioned as one possible solution to hard-to-abate sectors, but the technology is still underdeveloped.

Significant capital is allocated to support industry in their decarbonization efforts. Enova and Innovation Norway support projects for the development of new technology and production processes. One important part of the Norwegian decarbonization efforts is the decade-long support for CCS technology. This was touted as “Norway’s moon landing” by then-Prime Minister Stoltenberg in 2009. Currently, there is one major project close to launch for carbon capture at Heidelberg Norcem’s plant in Brevik and one at Celsio in Oslo. Moreover, Equinor is involved in the Longship project, providing a storage solution for captured CO<sub>2</sub> in geological formations on the Norwegian continental shelf. Contracts have been signed with several countries for storage.

It is justified to conclude that Norwegian authorities are committed to decarbonizing the energy system, provided that this can happen without ending Norwegian oil and



gas production, significantly reducing the competitiveness of Norwegian industry, or inflicting too stringent restrictions on the population's need for mobility, which carries a very high political risk of popular revolt.

The preferred policy instruments are primarily economic: the EU cap-and-trade system, support for technology development and innovation, and reform of taxes, duties, and levies to encourage consumption of low-emission alternatives where they exist.

Citation:

Energy Facts Norway. 2023. "Energy use by sector." <https://energifaktanorge.no/en/norsk-energibruk/energibruken-i-ulike-sektorer/>

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Miljøstatus. 2023. "Klimagassutslipp fra industri i Norge." <https://miljostatus.miljodirektoratet.no/tema/klima/norske-utslipp-av-klimagasser/klimagassutslipp-fra-industri/>

## Australia

### Score 6

The Australian government has committed to transitioning the economy to net-zero emissions by 2050. This plan emphasizes the critical role of technological breakthroughs and commits to investing in "priority technologies" that build on Australia's competitive advantages and significantly reduce emissions (Australian Government 2021). Central to the plan is the commitment to "ultra-low emissions electricity generation." Electricity generation, responsible for approximately 34% of the country's total emissions in 2019, is seen as key to environmental solutions for other sectors such as transport and buildings. According to government modeling, a substantial increase in renewable sources, driven by declining technology costs and substantial financial support, will drive down emissions in energy production to near-zero by 2050. Projections estimate that the share of energy production from renewables will rise from 23% in 2020 to 61% by 2030.

To address the challenge of reducing emissions to zero in some sectors, the plan identifies offset projects that involve investments in projects that draw carbon from the atmosphere and store it in vegetation and soil. The plan also aims to be adaptive and flexible, regularly refined in light of emerging technologies, changing practices, and the impact of the transition on various communities and regions.

In tandem to the new program, the Australian government has created the Climate Active partnership with Australian businesses to promote voluntary climate action. Climate Active issues certificates to businesses and other organizations (e.g., schools and universities) that reach net-zero emissions, providing incentives for these organizations to measure and reduce their emissions and informing their clients, customers, and stakeholders about their commitment to sustainability.

Critics of the plan point to its heavy reliance on technologies that are not yet widely available, suggesting that the net-zero commitment is not fully practical (Climate Council 2022). They argue that the pace of change needs to be faster, given the increasing frequency and intensity of climate crises in Australia and the environmental challenges facing several countries in the Asia-Pacific region. Suggested actions to accelerate the transition include strengthening laws underpinning the transition to a zero-emission economy, ending government support for fossil fuel extraction, supporting the expansion of green jobs, and ending land clearing and restoring degraded forests.

Citation:

Climate Council. 2023. "What the Climate Bill Is and What It's Not." <https://www.climatecouncil.org.au/what-the-climate-bill-is-and-what-its-not/>

Australian Government. 2021. "Australia's Whole-of-Economy Long-Term Emissions Reduction Plan." Australian Government Department of Industry, Science, Energy and Resources. <https://www.dceew.gov.au/sites/default/files/documents/australias-long-term-emissions-reduction-plan.pdf>

## Czechia

Score 6

Czechia has been relatively slow in pursuing the decarbonization of its energy system, with progress heavily dependent on EU requirements. Electricity production from renewable sources in Czechia has long lagged behind the European average, as has the share of renewable energy in consumption. The renewable energy share in total final energy consumption was 15.88% in 2019 and 17.7% in 2021, both figures below the OECD average. Electricity production from fossil fuels ranks first, with nuclear energy in second place. The energy crisis of 2022 shifted the ratio of energy production sources in favor of coal-fired power generation. As a result, emissions remain high, with CO<sub>2</sub> emissions from fuel combustion reaching 8.6 metric tons per capita in 2022, placing Czechia among the above-average polluters within the OECD.

In October 2023, the government approved a draft climate and energy plan outlining how the Czech economy should undergo the decarbonization process and meet its European climate and energy commitments by 2030. The plan emphasizes the development of renewable energy sources and energy savings. Currently, three critical documents in the field of climate and energy are under review: the Climate Protection Policy, the National Energy and Climate Plan, and the State Energy Concept. These documents will determine the Czech path to a zero-emission

economy and society in the coming years. However, there are doubts among environmental groups and within the government about whether the targets will be met with current policies.

In 2021, several environmental groups won a ruling from the Prague court obliging the government to set legally binding targets. However, the Supreme Court annulled this ruling in February 2023, citing the absence of a relevant law requiring such targets. In November 2023, representatives of the parliamentary Pirate Party published a draft climate law that included legally binding medium- and long-term targets to achieve carbon neutrality by 2050. The draft also specified the establishment of a new Climate Council to oversee a detailed implementation program. Although the Pirates are part of the government, they did not receive, and had previously failed to secure, government support.

## Ireland

### Score 6

To meet the required level of emissions reduction by 2030, the Irish government has committed to increasing the share of electricity generated from renewable sources to up to 80%. This plan emphasizes facilitating local community-based projects, delivering three new transmission grid connections to Northern Ireland, Great Britain, and the European Union, phasing out coal and peat-fired electricity generation, and ensuring that 20–30% of system demand is flexible by 2030 (CAP 2021).

Achieving a 100% renewable energy system necessitates the rollout of renewable energy infrastructure, political will to plan and invest in new grid infrastructure, including a north-south interconnector, and the implementation of Eirgrid's DS3 program. Energy system decarbonization is governed chiefly by the national legislative Climate Action and Low Carbon Development (Amendment) Act 2021 and the EU effort-sharing regulation. Policy is guided by the Climate Action Plans and the EU requirement for National Energy and Climate Plans and an associated long-term strategy.

Ireland does not yet have a strategy or an implementation roadmap that effectively meets its national obligations to fully decarbonize the energy system by 2050 without relying on speculative technologies (Torney and O'Mahony 2023). National energy modeling has not identified technically feasible scenarios in which Ireland can remain within its population-weighted share of the remaining global carbon budget for 1.5°C (McGookin et al. 2023). Ireland's strong dependence on fossil fuels necessitates systemic transitions and transformations that have not yet been sufficiently articulated in national policy or in the analysis used to frame policy development. Addressing these gaps will require transformative measures, such as shifting development paths and demand management (O'Mahony and Torney 2023).

While policies and measures to meet decarbonization goals by 2050 are inadequate, progress has been made in policy implementation architecture. The Department of

Environment and Climate Change, under a Green Party Minister since 2020, has built upon progress in Climate Action Planning and oversees an annual process of policy renewal for the 2030 horizon. This process includes other ministries and agency stakeholders in a whole-of-government approach. Sector-specific actions are articulated toward meeting sectoral budgets, with quarterly implementation monitoring by a dedicated unit in the Prime Minister's Office (Department of the Taoiseach).

Notable progress includes legislating to divest public funds from fossil fuel companies, halting new fossil fuel exploration, and banning hydraulic fracking for gas. Additionally, Bord na Móna, the semi-state company responsible for developing and exploiting peatlands, has transitioned from peat extraction to peatland rehabilitation and renewable energy. After more than 70 years of operation, carbon-intensive peat-fired electricity ended in Ireland in December 2023, with a switch to biomass at the final plant remaining open, at Edenderry in County Offaly. However, failure to deliver the necessary renewable generation capacity, demand reduction, or electricity storage has undermined previous commitments to close the Moneypoint coal-fired generation plant in 2025. It is expected that Ireland will exceed the sectoral target for electricity in both the first and the second carbon budget periods up to 2030 (CCAC 2023).

Under the 2021 Climate Act, relevant ministers are required to be accountable to both houses of the Oireachtas, as well as to the relevant Oireachtas committee. The political and legal consequences for ministers if or when targets are missed remain to be seen.

Citation:

CCAC (Climate Change Advisory Council). 2023. Annual Review 2023. <https://www.climatecouncil.ie/councilpublications/annualreviewandreport/CCAC-AR-2023-postfinal.pdf>  
McGookin, et al. 2023. Ireland's Climate Change Assessment 2023: Volume 2: Achieving Climate Neutrality by 2050 [https://www.epa.ie/publications/monitoring-assessment/climate-change/ICCA\\_Volume-2.pdf](https://www.epa.ie/publications/monitoring-assessment/climate-change/ICCA_Volume-2.pdf)  
O'Mahony, Mary, and Diarmuid Torney. 2023. "Transforming Development: Economy, Innovation and Finance." Irish Climate Change Assessment 4 (6). [https://www.epa.ie/publications/monitoring-assessment/climate-change/ICCA\\_Volume-4.pdf](https://www.epa.ie/publications/monitoring-assessment/climate-change/ICCA_Volume-4.pdf)  
Torney, D., and O'Mahony, T. 2023. "Transforming Governance and Policy." Chapter 7 Volume 4 of Irish Climate Change Assessment. [https://www.epa.ie/publications/monitoring-assessment/climate-change/ICCA\\_Volume-4.pdf](https://www.epa.ie/publications/monitoring-assessment/climate-change/ICCA_Volume-4.pdf)

## Belgium

Score 5

Belgium has made strides in its energy transition, including deferring the closure of two nuclear power plants by a decade, initiating an energy savings campaign, and offering financial incentives for energy-efficient renovations. However, given its heavy dependence on imported fossil fuels, more efforts are needed to achieve climate neutrality by 2050.

The country is a leader in offshore wind power development, but onshore wind power development faces hurdles due to public acceptance and permit issues.

Belgium's renewable energy consumption was only 13% in 2021, and there is considerable potential for growth, particularly in rooftop solar power. To encourage this, the VAT for solar panel installations in houses less than 10 years old was reduced to 6% until the end of 2023.

Estelle Cantillon, a Belgian economist specializing in sustainability and energy, suggests that Belgium is far from achieving carbon neutrality and lacks adequate preparation. The country's infrastructure is insufficient for technological change and electrification, particularly in terms of smart meters. Behavioral change is also lagging (Paquay 2023).

According to Cantillon, priorities include ending fossil fuel subsidies, setting a higher carbon price, and decarbonizing energy use as much as possible. Currently, fossil fuels still account for more than 70% of energy consumption (see data from our world in data). She advocates for the development of wind power, solar energy, biomass, geothermal energy, and nuclear power. She also emphasizes the need to decarbonize heat, improve energy efficiency, and promote energy sobriety. Reducing fossil fuel usage in buildings is a significant challenge, as heating buildings accounted for 11% of oil demand and 37% of gas consumption in 2020. A large portion of Belgium's buildings are old, with about 80% still lacking energy efficiency. Regional authorities have implemented or are considering strategies to enhance energy efficiency in buildings. These include prohibiting the use of fossil fuels in new constructions, enforcing energy-saving renovations, gradually eliminating financial aid for heating based on fossil fuels, and promoting incentives for low-carbon heating solutions (European Commission 2023). Cantillon further stresses that while progress has been made in decarbonizing electricity, challenges remain in the industrial sector. In 2020, oil and natural gas accounted for nearly 70% of the sector's energy demand. Encouraging electrification and the use of industrial heat pumps in factories with low heat demand could help increase efficiency (European Commission 2023). In terms of transport, significant work is needed, especially in modal shift. The price difference between electricity and gas and fuel oil in Belgium is too small.

Further policy reforms and investments to reduce greenhouse gas emissions in the energy, building, and transport sectors are necessary. These actions will also help reduce Belgium's high dependency on fossil fuel imports and ensure supply security. The war in Ukraine might have acted as a wake-up call, as Belgium made significant progress in reducing its dependency on Russian gas and is expected to continue its diversification efforts.

According to a McKinsey report, achieving carbon neutrality in Belgium would cost 415 billion euros in cumulative investments by 2050, equivalent to 2-3% of the country's GDP each year.

Citation:

<https://www.lesoir.be/552932/article/2023-12-01/cop28-comment-la-belgique-peut-atteindre-la-neutralite-en-2050>

<https://ourworldindata.org/energy/country/belgium#>

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## Canada

### Score 5

As a major exporter of oil, gas, and coal, Canada has made numerous statements expressing a commitment to decarbonization; however, these claims are often seen as implausible, and the country has never achieved any of its climate goals. In 2016, Canada signed the Paris Climate Agreement, committing to reduce economy-wide greenhouse gas emissions by 30% below 2005 levels by 2030. This includes emissions from the energy sector. Nevertheless, Canada is unlikely to meet these goals. During the 2021 federal election, the Liberal Party promised to introduce a plan to achieve net-zero emissions by 2050. After being re-elected, however, they have yet to unveil a definitive roadmap or set of policies to reliably reach net-zero by 2050. Most projections from the oil and gas industry indicate that fossil fuel production will continue well past 2050, suggesting the industry does not have a clear mandate from the government to fully decarbonize on that timeline.

The federal government of Canada, for example, has made commitments to reduce emissions and transition toward clean energy, but a definitive commitment to fully decarbonizing the energy system by 2050 remains ambiguous. While the federal government has incentivized the development of clean technologies, these efforts have not been tied to concrete, detailed performance metrics.

Canada has a carbon tax and has announced plans to move toward an emissions trading system, but many problems remain (Canada 2018). While the federal government has implemented policies like carbon pricing and clean fuel standards to begin driving down emissions, the current targets and policies are not enough to achieve full decarbonization by 2050, according to environmental groups. In addition, the government has invested billions in a new West Coast pipeline designed to move carbon-intensive heavy oil from Alberta to Pacific coast ports.

Citation:

Canada, Environment and Climate Change. 2018. "How Carbon Pricing Works." <https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/putting-price-on-carbon-pollution.html>

## Hungary

### Score 5

Hungary's climate and energy policies prioritize energy security, the reduction of fossil fuel use and affordable energy prices. The Climate Protection Law of 2020 created a legal obligation for these objectives. Implementation is based on the

National Energy and Climate Plan (NECP) 2020 and the National Clean Development Strategy (NCDS) 2021. Given the lack of an environmental ministry, the Ministry of Technology and Industry was originally the implementing authority. After the 2022 parliamentary election, the government established a Ministry for Energy, where a state secretary is now responsible for climate-change issues – a clear upgrade compared to the previous governance structure. Societal input is organized through the Environment Council, which comprises three groups: environmental organizations, trade and economic interest representatives, and academic representatives appointed by the president of the Hungarian Academy of Sciences. Consultations with civil society organizations took place during the creation of the plans, but a lack of documentation makes it unclear whether their suggestions impacted the texts.

Hungary's carbon neutrality goal is set for 2050, with an interim target of achieving a 90% low-carbon electricity mix by 2030. These targets were updated as part of the European Green Deal and in response to the war in Ukraine. The European Commission's assessment indicated that the plan is "not entirely convincing on how these targets will be reached" (European Commission 2023:4), criticizing the lack of detail regarding the scope, timing, financing sources and expected impacts of new measures. The first setback occurred in 2022 when the government permitted increased domestic production of oil and gas, prompted by Russia's invasion of Ukraine and rising energy prices. Hungary's energy sector decarbonization relies primarily on a solar strategy that is beginning to gain traction, but is hindered by grid shortcomings. The other main pillar is nuclear energy production in the Paks I and II nuclear power plants. Hungary has the third-highest share of electricity generation from nuclear sources among International Energy Agency (IEA) member countries, with the government placing its strongest emphasis here.

In 2023, the government also announced the construction of three new combined cycle gas turbine (CCGT) power plants to meet increasing industrial demand (Daily News Hungary 2023). A weak point in the original strategy appears to be the absence of instruments to enhance energy efficiency and the dispersal of regulatory competencies across multiple government branches (IEA 2022: 12). The revised version of the strategy seems to address these issues more effectively.

Citation:

Daily News Hungary. 2023. "This is where Hungary will build its new gas power plants." 15 March. <https://dailynewshungary.com/hungary-has-decided-where-to-build-its-new-gas-power-plants/>

International Energy Agency (IEA). 2022. "Hungary 2022 Energy Policy Review." <https://iea.blob.core.windows.net/assets/9f137e48-13e4-4aab-b13a-dcc90adf7e38/Hungary2022.pdf>

European Commission. 2023. "Assessment of the Draft Updated National Energy and Climate Plan of Hungary." 18.12.2023 SWD(2023) 916 final. [https://commission.europa.eu/system/files/2023-12/SWD\\_Assessment\\_draft\\_updated\\_NECP\\_Hungary\\_2023.pdf](https://commission.europa.eu/system/files/2023-12/SWD_Assessment_draft_updated_NECP_Hungary_2023.pdf)

## Italy

**Score 5** Decarbonization is a primary objective of the National Plan for the Ecological Transition, aiming to achieve net-zero greenhouse gas emissions by 2050. By 2030, the goal is to reduce emissions by 55%, aligning with the European “Fit for 55” target. The NRRP allocates substantial financial resources for environmental transition, including the decarbonization of industrial production and the shift to renewable energy sources.

However, critics argue that financial investment is overly focused on securing bonuses and incentives, even when they are not necessary. The “Zero Carbon Policy Agenda” report by the Politecnico di Milano indicates that Italy is progressing slowly toward decarbonization, with no chance of reaching the 2030 target. Implementation challenges have increased under the Meloni administration, with significant resistance from stakeholders and difficulty in government management. The National Integrated Energy and Climate Plan (Pniec) proposed by the Meloni government was unanimously rejected by all major environmental groups for setting lower emission reduction and renewable energy targets than those required by the EU and proposed by national energy producers.

Citation:

- Meloni government plan on energy and climate. 2023. [https://www.mase.gov.it/sites/default/files/PNIEC\\_2023.pdf](https://www.mase.gov.it/sites/default/files/PNIEC_2023.pdf)  
Politecnico di Milano. 2023. “Zero Carbon Policy Agenda.” <https://www.energystrategy.it/es-download/>

## Slovakia

**Score 5** To decarbonize the Slovak economy according to the WAM scenario (“with additional measures”), it will be necessary to reinvest €8 billion over the next decade, in addition to the WEM reference scenario (“with existing measures”). From 2031 to 2050, this amount will increase to €196 billion. By 2040, the average additional annual expenses will represent 1.8% of GDP; in the years 2020–2050, it will represent up to 4.2% per year. These costs include investments borne by households, the business sector, and the state. However, the Slovak Republic has adopted a higher decarbonization target than modeled in the WAM scenario (climate neutrality until 2050), which implies higher costs for decarbonization than stated in the Low-Carbon Development Strategy of the Slovak Republic until 2030 with a View to 2050. The strategy does not have exact data on costs and is broken down into sector-specific action plans: energy, industrial processes, transport, agriculture, land-use change and forestry, and waste sectors. Slovakia is lagging in its framework to support energy communities and enable consumers to actively participate in the energy transition (Ministry of the Environment of the Slovak Republic, 2023).

The role and nature of bioenergy in heating and transport for achieving renewable energy sources and greenhouse gas reduction targets need to be clearly defined in relation to a realistic assessment of natural gas and electrification. Slovakia must



provide long-term certainty with measurable commitments for businesses to make investments. Meeting the EU-level target of a 55% reduction, translating to approximately 52.5% for Slovakia, will require enabling legislation for renewables and energy efficiency, as well as stricter regulations for persistently problematic sectors like transport and agriculture (GLOBSEC, 2020).

Slovakia has high ambitions to transform its energy system. Further policy support is needed to help decarbonize the economy. The recovery and resilience plan envisions direct investments to increase installed renewables capacity by 120 MW, representing approximately 20% of its current wind and solar capacity. The plan includes key market design reforms and support for renewables to accelerate the uptake of clean energy. Specifically, the updated legal framework will facilitate new activities and access to the electricity market – energy communities, aggregators, self-consumers, and electricity storage – and increase the possibilities of connecting new renewable sources to the grid (European Commission, 2023).

Citation:

The Ministry of the Environment of the Slovak Republic. 2023. <https://www.minzp.sk/klima/nizkouglikova-strategia/>

GLOBSEC. 2020. “Slovakia Low Carbon Economy Pathways. Achieving more by 2030.” [https://www.globsec.org/sites/default/files/2021-02/Slovakia-LCEP\\_Achieving-more-by-2030\\_Dec2020.pdf](https://www.globsec.org/sites/default/files/2021-02/Slovakia-LCEP_Achieving-more-by-2030_Dec2020.pdf)

European Commission. 2023. “Country Report – Slovakia.” [https://economy-finance.ec.europa.eu/system/files/2023-05/SK\\_SWD\\_2023\\_625\\_en.pdf](https://economy-finance.ec.europa.eu/system/files/2023-05/SK_SWD_2023_625_en.pdf)

## Israel

### Score 4

A carbon tax was approved in January 2024, although its implementation has been postponed to 2025 (Ashkenazi 2024). The new carbon tax will include government subsidies to industry, but lacks specific requirements for improved energy efficiency in factories. Alongside the adoption of the carbon tax, the government increased subsidies for natural gas supply, which the Ministry of Environmental Protection opposed. The government also approved subsidies for enhancing energy efficiency, although it has been argued that these are under-budgeted. This reflects the government’s general reliance on market regulation rather than significant public investment.

The prevailing taxation on fossil fuels mainly pertains to gas for cars and industry. The existing policy does not compensate for the full costs and externalities of using carbon, as found in a policy paper prepared by the Ministry of Environmental Protection in 2021.

In 2021, the Ministry of Environmental Protection, along with the ministries of economy, energy and Transportation, and the OECD, began a strategic process to develop a roadmap for decreasing carbon use by 2050. The programs are broken

down by sector: energy, transportation, construction, industry and waste. Each sector includes a detailed plan with specific measures and goals (Ministry of Environmental Protection, 2021).

In addition, the Ministry of Environmental Protection has proposed the Climate Law to address carbon and energy-related issues; however, the law has not yet passed. The OECD stated in May 2023 that Israel was failing to meet all the climate standards set by the organization.

Citation:

Ashkenazi, S. 2024. "A Moderate Increase in the Price of Electricity, a Low Budget for Energy Efficiency: A New Carbon Tax Was Approved" (Hebrew). Calcalist, January 15. [https://www.calcalist.co.il/local\\_news/article/hyq2ux7k6](https://www.calcalist.co.il/local_news/article/hyq2ux7k6)  
Ministry of Environmental Protection. 2021. "Pricing of carbon in Israel." [https://www.idi.org.il/media/17224/carbon\\_pricing\\_in\\_israel.pdf](https://www.idi.org.il/media/17224/carbon_pricing_in_israel.pdf)

## Japan

Score 4

Japan increased its reliance on fossil fuels after the crisis at the Fukushima Daiichi Nuclear Power Plant in March 2011 and remains highly dependent on fossil fuels, with 87% of energy production coming from burning coal, gas and oil in 2022. In April 2021, Prime Minister Suga Yoshihide announced the aim to reduce greenhouse gas emissions by 46% by 2030 compared with 2013 levels and to achieve carbon neutrality by 2050. This is considerably more ambitious than Japan's previous target of a 26% reduction by 2030.

In February 2023, the Kishida government approved the Basic Policy for Realizing the GX: Green Transformation Policy, followed by the Act on Promotion of a Smooth Transition to a Decarbonized Growth-Oriented Economic Structure, which was passed in the Diet in May 2023. The Basic Policy contains a 10-year roadmap of decarbonization based on the creation of a voluntary baseline-and-credit system, as well as a mandatory emissions trading system and carbon levy. The strategy encompasses 14 action plans, such as reducing energy usage, promoting renewable energy, reactivating nuclear power plants, and introducing hydrogen and ammonia-based technologies. The implementation of the decarbonization policy will be supervised by the newly created GX Promotion Agency. JPY 150 trillion, including JPY 20 trillion in GX Economic Transition Bonds, will be spent to achieve decarbonization goals in line with the strategies formulated by the Ministry of Economy, Trade and Industry.

According to the Climate Action Tracker rating from November 2023, Japan's policy is insufficient to achieve the goals of the Paris Agreement. The Basic Policy for Realizing the GX has been criticized for lacking criteria related to reducing greenhouse gas emissions in the distribution of public funds for decarbonization. Some of the promoted "clean coal" technologies, such as the use of hydrogen and ammonia derived from fossil fuels, may even lead to an increase in greenhouse gas emissions. The carbon levy, planned for 2028, is expected to be set at a low level. As

the decarbonization strategy is led by the Ministry of Economy, Trade and Industry, the primary focus appears to be on promoting economic growth rather than addressing global warming.

Citation:

Climate Action Tracker. 2023. "Japan." <https://climateactiontracker.org/countries/japan/>

FoE Japan. 2023. "We oppose the 'GX Promotion Bill' which creates an unclear flow of funds to nuclear power and large-scale emitters." <https://foejapan.org/en/issue/20230410/12300/>

International Carbon Action Partnership. 2023. "Japan's Cabinet Approves Policy Roadmap Including Plans for National ETS." <https://icapcarbonaction.com/en/news/japans-cabinet-approves-policy-roadmap-including-plans-national-ets>

Ministry of Economy, Trade and Industry. "GX Jitsugen ni muketa Kihon Hôshin – Kongo 10-nen o Misueta Rôdomappu" [Basic Policy for Realizing the GX – Roadmap for the next 10 years]. [https://www.meti.go.jp/press/2022/02/20230210002/20230210002\\_1.pdf](https://www.meti.go.jp/press/2022/02/20230210002/20230210002_1.pdf)

## Poland

Score 4

Poland, known for its carbon-intensive economy, has been gradually working toward decarbonization. A total of 72% of energy produced and 82% of electricity in Poland relies on solid fuels, giving it the second-highest rate of fossil-fuel-based energy production in the EU. Despite being the second-largest coal producer in the EU, Poland reduced net greenhouse gas emissions by 20.1% in 2021 compared to 1990 levels. While emissions decreased across various sectors from 1990 to 2021, the transport sector saw an increase of 229%, reflecting a trend observed throughout the EU.

In terms of emissions per capita and the greenhouse gas intensity of GDP, Poland exceeded the EU averages in 2021 (Enerdata 2023). Renewable energy accounted for 18.84% of energy production, compared to the EU average of 22.47% in 2022. This figure is similar to that of Czechia (17.98%), Slovakia (17.69%) and Hungary (14.05%) (European Environment Agency 2024). The steady increase in the use of renewable energy sources was due to EU-sponsored programs for individual households and the cogeneration of electricity using coal and biofuels.

In February 2021, the government embraced its updated energy policy, PEP2040, extending the vision until 2040. The policy aims for 23% of energy to come from renewables by 2030, with substantial reductions in coal usage to at least 56% by 2030, a boost in wind energy and the introduction of Poland's first nuclear power reactor in 2033. Poland is also adapting to the Green Deal framework of the European Union, including the FITfor55 program, and is expected to be the largest beneficiary of the EU's budget for low-carbon transformation. Between 2025 and 2032, Poland is projected to receive €12.7 billion from the Social Climate Fund, constituting 17.6% of the total budget (International Trade Administration, 2023).

Despite the urgent need for green transformation, the PiS government hesitated to downsize its national coal industry, planning to close the remaining mines by 2049

despite their economic inefficiency. This decision was influenced by notions of sovereignty and the political significance of the Upper Silesia mining region. In 2022, Poland spent approximately €41 billion on fossil fuel imports due to increased demand and favorable prices, although it refrained from substantial subsidies (0.35% of GDP compared to 0.76% in the EU). Ranked 20th in Europe for carbon taxes, Poland shifted from being an energy exporter in 2021 to an importer, with imports coming mainly from Germany, due to that country's lower renewable energy prices. However, there were no significant efforts to modernize the country's existing infrastructure.

Despite recognizing the importance of natural gas for a secure transition from coal, Poland ceased its gas imports from Russia after the Ukraine war. Instead, the country opted to focus on LNG imports and initiated the Baltic Pipe Line in September 2022 (Polish Economic Institute 2023). Plans for expanding energy capacity included a preliminary decision in July 2023 to build a nuclear power plant, although a potential second plant faced challenges under EU competition procedures.

Another key pillar in Poland's decarbonization plan has involved promoting electromobility. The Sustainable Development of Transport Strategy aimed to have 600,000 electric vehicles on the country's roads by 2025, but as of October 2023, only a bit more than 90,000 were registered. Subsidies introduced in 2021 accelerated the trend, but fell short of expectations.

Poland's energy policies under the conservative government were heavily politicized, often blaming the EU and "Putinflation" for high energy prices. The focus on protecting Polish "sovereignty" led to opposition to EU energy and climate policies rather than the creation of alliances. A significant conflict area involved the EU's emissions trading system (ETS), with Poland being required to purchase carbon allowances in 2022. The Sovereign Poland party, a coalition partner in the PiS government, proposed suspending Poland's ETS participation in November 2022. In May 2023, they announced plans to push for unanimous EU decision-making in this area.

The liberal government that gained power in the October 2023 parliamentary elections declared that it would focus strongly on a green transformation, especially in the areas of renewable energy and a just transition. However, the climate neutrality goal was not mentioned in the coalition agreement.

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