

A national action plan for energy efficiency in Denmark

This is how Denmark becomes a green frontrunner in energy efficiency and strengthens its competitiveness in the race to save energy.



MAIN RECOMMENDATIONS

- Within the next four months, the Danish government should present an ambitious action plan for energy efficiency, that will pave the way towards a broad political agreement before the end of April 2024.
- Denmark should set much higher targets for energy efficiency compared with the EU and reduce the energy consumption by at least 23 per cent before 2030 compared to 2019.
- The Danish CO₂ tax – including the EU's quota price – should be increased to 200 €/ton CO₂e in 2030 to increase the economic incentives to reduce the use of fossil fuels.
- Speed up the electrification of transport, heat supply and industry since it over time can reduce the total energy consumption by up to 40 percent. This action plan from Green Transition Denmark shows that it is possible to reduce more than 40 percent of the Danish energy consumption towards 2040.
- Ban the sale of new fossil fuel powered vehicles from 2025 and phase out all oil and gas boilers.
- Lower the requirements of the financial limits of constructions and renovations in the municipalities and the regions while simultaneously requiring that at least 4 percent of the government buildings should be energy renovated on a yearly basis.
- Implement a requirement on energy improvement in buildings, so that the buildings with the lowest energy labels are improved by one class as a minimum before sale.

Introduction

Denmark and the rest of the EU have been in a deep energy and supply crisis since Russia invaded Ukraine on February 24, 2022. All EU countries have been under historically high pressure to stock up on gas and secure the energy supplies. The EU countries have tried to accelerate the expansion of solar and wind power during 2022 and 2023, and never have so many heat pumps been installed.

But the overall equation cannot add up without remarkable energy efficiencies. If energy consumption is not reduced, the costs of the green transition will be considerably increased.

If Denmark makes an extra effort to reduce the energy consumption, it can become a valuable contribution to

the reduction of the CO₂ emissions, where Denmark is otherwise behind in relation to the Climate Law's reduction targets for 2025 and 2030.

Reductions on energy consumption can also reduce the total resource consumption of the green transition, since the amount of needed additional solar and wind power will be smaller compared to a scenario with continued growth in the energy consumption. At the same time, it becomes easier to ensure a reasonable balance in relation to other considerations such as land use, biodiversity, and nature. Therefore, an active effort towards energy savings constitutes an indispensable element in the green transition. This is also evident from the International Energy Agency's (IEA) scenario for achieving climate neutrality by 2050.

In their updated [net-zero carbon scenario](#) IEA expects the annual energy efficiency per GDP unit to be twice as high in the 2020s as in 2010s. IEA recommends that the energy intensity should increase by 4 percent annually¹. If Denmark were to do this, we could save 30 percent of the energy consumption per GDP unit over ten years. If we instead only increase the energy intensity by 3 percent annually, we can save 24 percent of the energy consumption. This goal is realistic to achieve both technologically and economically. If the energy intensity is increased by 4 percent annually, we would save more than half of our energy consumption per GDP unit by 2040.

But the Danish efforts to ensure energy savings are still completely insufficient. Oil, fossil gas, and coal accounted for nearly 53 percent of Denmark's gross energy consumption of 709 PJ in 2022, and a total of 29 million tons CO₂e are emitted from the Danish energy consumption². For the sake of the climate, it is a necessary task to accelerate the transition away from fossil fuels. The more energy we save, the faster we can become independent of the import of fossil fuels and thus become 100 percent self-sufficient with renewable energy.

Green Transition Denmark (GTD) therefore presents a national action plan to ensure far greater energy savings in the short and long term, while also making Denmark one of the most energy efficient member states in Europe. The action plan will ensure that we are energy efficient across all sectors.

The good news is that the fastest and most cost-effective answer to the energy crisis is to save energy. Many initiatives will have payback time within a few years. A larger [mapping](#) made by the Danish Energy Agency have shown that on average, the industry, agriculture and construction sectors can save around 10 percent of their energy consumption with investments that have a payback period of less than four years³. The manufacturing industry can save 1.8 billion DKK and 18 percent of the energy consumption in a period of 10 years.

Similarly, there are analyses⁴, that show large potential for energy savings in our buildings. If one-fifth of the municipal buildings were energy renovated each year from

2023 to 2027, with the worst performing buildings being renovated first, it is possible to achieve accumulated operational cost savings of approximately 3.7 billion DKK. The accumulated CO₂ reduction from the energy consumption in these municipal buildings will be approximately 300,000 tons of CO₂ in 2030 according to a report made by [Ramboll for the Danish Energy Agency](#)⁵.

An ambitious energy efficiency effort will strengthen the competitiveness of Denmark and Danish companies in an era where energy prices are expected to increase continuously. International research has shown that energy efficiency can account for about 25 percent of the economic growth⁶. A targeted effort to use the scarce resources in an effective manner and minimize the energy loss throughout the whole value chain can make a crucial contribution to the development in society.

There will also be positive side effects from increased employment. An ambitious and rapid implementation of the recommendations will also reduce Denmark's CO₂ emissions as the consumption of fossil fuels decreases, and some of the actions – such as lowering the highway speed limit – can be a useful contribution to achieving Denmark's 2025 climate goals, where, according to The Danish Council on Climate Change, there is still a need to reduce by more than 2 million tons CO₂e⁷.

GTD estimates, that the national action plan for energy efficiency will help Denmark to achieve the yearly reduction goals to which we are committed under the EU Climate Law. If the action plan is implemented, Denmark will be able to reduce the yearly emissions with at least 5 million tons CO₂e in 2030 while the economic activity of the society grows with 1 percent on average per year during the 2020s, according to our calculations.

GTD's proposal for a national action plan on energy efficiency is based on the principle that energy savings should be seen as "the first fuel". This is also a key principle in the latest Energy Efficiency Directive. In the green transition it is important to always consider the opportunities to reduce energy consumption first. This will often be the most cost-effective way to carry out the transition.

A new action plan for energy efficiency should not only contribute to reductions of the energy consumption in private and public buildings, in the business sector and in transport. It should also ensure changes in behavior, that can reduce the future energy demand as well as to promote investments in much more energy efficient technologies.

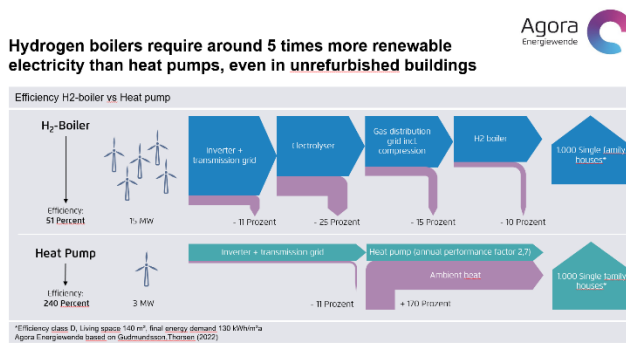
Electrification saves energy

The ambitious action plan assumes that more structural reforms will be made, and in this context, it is crucial to accelerate the electrification of society. Electrification is a shortcut to save energy in all sectors. The potential is great, and some [research studies](#) estimate that the transformation from a fossil energy system to an electrified energy system can reduce the total energy consumption with up to 40 percent⁸.

Individual heat pumps are three to five times as energy efficient as houses heated with oil or gas boilers. Therefore, a national ban on installation of new fossil boilers should be implemented as soon as possible. District heating plants can invest in industrial heat pumps since they are far more energy efficient compared to burning of fossil fuels or solid biomass. This action will also contribute to reducing air pollution and gradually reducing Denmark’s CO₂ emissions from burning of biomass, which currently accounts for more than 15 million tons CO₂.

Within heat supply, heat pumps are much more energy efficient than hydrogen. The figure below shows how much additional wind capacity it would require heating 1000 single family houses with green gases in the form of hydrogen compared to heat pumps. Heat pumps thus use only one fifth of the electricity that would be required to deliver the same amount of heat using hydrogen. In a Danish context, heat pumps are also way more energy efficient than heating with biomethane.

Figure 1: **Electric capacity for heating with hydrogen and heat pumps**



Source: Agora Energiewende, Gudmundsson, Thorsen, 2022.

Also in the transport sector, electrification of land transport is a central contribution to ensure energy savings.

Electric cars are much more efficient than fossil cars, with an [energy loss](#) of 15-20 percent in electric cars compared to 64-75 percent in fossil cars. The market for electric cars can rapidly be upscaled, and Green Transition Denmark have long recommended the implementation of a national ban on sale of new fossil fuel cars starting from 2025. Such a ban will accelerate the phasing out of fossil fuel cars and thus contribute to a reduction of the import of oil and reduce greenhouse gas emissions. At the same time, the use of e-fuels in land transport should be avoided through legislative requirements, since electric cars can travel five to six times further than cars using e-fuels, on the same amount of renewable energy.

Direct electrification results in a much lower energy loss than indirect electrification, where green hydrogen is produced through renewable energy and electrolysis⁹. Hydrogen cars are a costly and energy intensive impasse in the decarbonization of road transport, and the political framework should promote a rapid electrification of road transport.

There are considerable gains to achieve in the construction sector. A diesel-powered excavator wastes a lot of energy, while an electric excavator can perform the same work for only one fourth of the energy, according to some

[calculations](#)¹⁰. An electrification of the machinery in agriculture could reduce the sector's greenhouse gas emissions by up to 1 million tons of CO₂, and the transition can be accelerated by removing the sector's exemption from the diesel tax and by increasing the diesel tax to the German level.

In the industry, there is further potential for significant gains by accelerating electrification. A [mapping](#) done by the Danish Energy Agency have shown that there are good opportunities to electrify thermal end uses (such as drying, steaming, distillation, melting, casting, process heat and space heating), and that such an electrification can save half of the energy consumption in the companies, if the potential is fully realized for all end uses¹¹.

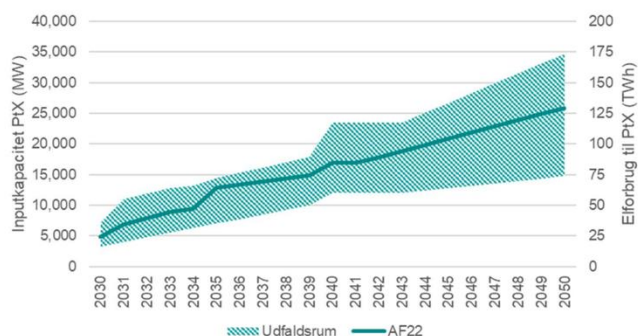
Timely prudence

The more efficiently we use energy, the smarter the future design of the Danish energy system will be, so that we can achieve cost-effective and rapid expansion of solar and wind energy and geothermal heat, while also providing a sufficient amount of renewable energy for data centers and the new energy intensive Power-to-X plants planned in Denmark.

It is a race against time. The planned large-scale expansion of PtX plants, which through electrolysis will produce green hydrogen and the next generation of sustainable e-fuels for air and maritime transport on the intercontinental routes, is very energy intensive.

The latest projections from the [Danish Energy Agency](#) suggests that up to 75 TWh of electricity may be needed for the Danish PtX plants in 2040, and by 2050, that the electricity consumption of these plants can grow exponentially to 125-175 TWh. See the figure below.

Figure 2: **Projection of the electricity consumption for PtX (MW, beginning of year | TWh)**



Source: The Danish Energy Agency, background note, 2022.

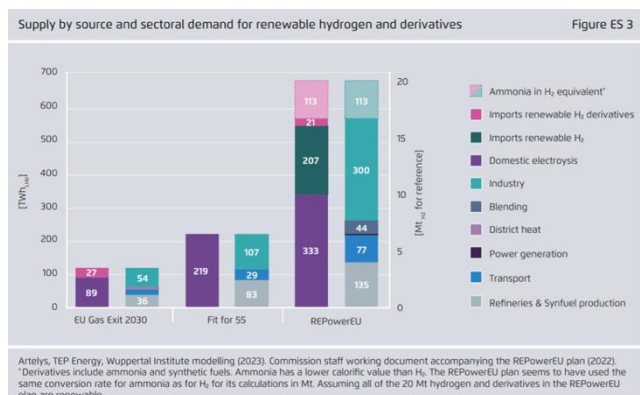
This is almost as much as the current Danish total energy consumption. Just over a third is expected to be used for exports, and the EU countries will definitely demand larger quantities e-fuels in the 2030s and 2040s.

The total energy equation cannot add up in the future without an ambitious and targeted effort to lower the existing energy consumption in all sectors. At the same time, research and development should be conducted to make the new PtX plants as energy efficient as possible, and to ensure full utilization of surplus heat. The new action plan for energy efficiency should help to address these challenges, and to ensure a more cost-effective transformation of the Danish energy sector.

A new analysis made by the German energy think tank, Agora Energiewende – in cooperation with the Wuppertal Institute - shows that a strong upscaling of green hydrogen will not be the most energy efficient way for EU countries to free themselves from Russian gas¹². In their report, [Breaking free from fossil gas. A new path to a climate-neutral Europe](#) they instead recommend that the EU countries focus on energy efficiency and electrification together with a massive upscaling of solar and wind power, district heating and a large heat pump roll out. Such a strategy can reduce the need for hydrogen in Europe's total energy mix to less than one fifth of what the European Commission's REPowerEU plan suggests by 2030 – that is from 666 TWh to 116 TWh. See figure 3.

Figure 3: **The need for green hydrogen in different scenarios**

An offensive strategy for energy efficiency, electrification, and renewable energy in the EU can reduce the need for green hydrogen.



Source: Agora Energiewende (2023): Breaking free from fossil gas. A new path to a climate-neutral Europe.

An important crossroad

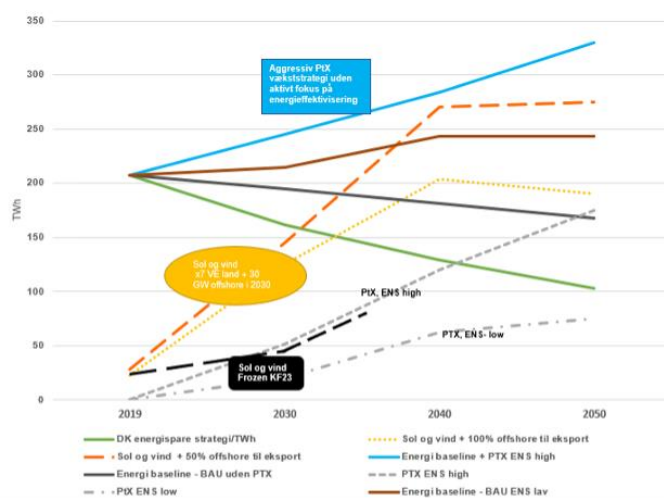
Energy efficiency and electrification, along with rapid up-scaling of solar and wind power, are the most energy-efficient strategy for Denmark. Below is a figure showing four future energy consumption scenarios for Denmark, illustrating the importance of energy efficiency. It is possible for Denmark to become 100 percent self-sufficient with solar and wind power already in the 2030s, if a more moderate expansion of Power-to-X is chosen instead of what is anticipated in the most optimistic projections. On the other hand, if a massive growth in Power-to-X is chosen without ensuring remarkable energy efficiencies, the overall equation will not add up. Currently, there is not enough green electricity in the government’s renewable energy plans for the strong expansion of Power-to-X shown in the Danish Energy Agency’s high-end projection until 2040 (figure 2). And since the government hasn’t made concrete action plans for how to reduce the energy consumption, it could bring Denmark into a new type of “supply crisis”, with a future shortage of solar and wind power to match the demand from the PtX plants.

This is why it is important to increase energy efficiency in the Danish economy as soon as possible. Therefore, Green Transition Denmark recommends that Denmark –

as recommended by IEA – sets an ambitious national goal to increase energy intensity per GDP unit with 4 percent each year until 2040. If the technical potentials in the energy efficiency is realized and you reap the fruits of a larger electrification in the Danish energy system, Green Transition Denmark estimates that it is possible to reduce the current energy consumption by at least 40 percent by 2040. See figure 4.

Figure 4: **Four scenarios on Denmark’s energy consumption, TWh**

Energy efficiencies and a massive upscaling of solar and wind power can make Denmark self-sufficient in the early 2030s.



Source: Denmark’s total gross energy consumption in four different scenarios, own calculations, Green Transition Denmark, 2023.

Assumptions: Denmark’s total gross energy consumption in 2019 was 207 TWh. The energy savings strategy assumes a 23 percent reduction from 2019-2030, and that the effort to save energy will be maintained at the same high level in the 2040s. This is realistic with increasing electrification, energy renovations and other energy-saving initiatives. Energy baseline scenarios are based on trend projection from the Danish Energy Agency’s projection in the National Energy Balance 2023. The difference between the three scenarios based on energy baseline is fluctuations in the energy consumption in the Danish Energy Agency’s projections of PtX expansion (high, low and no PtX) – see also figure 2.

If the ambitious strategy for energy efficiency is coupled to an accelerated expansion of onshore solar and wind power, ensuring a sevenfold increase towards 2030, and at the same time ensuring 30 GW offshore wind power in 2030, then Denmark will be 100 percent self-sufficient with solar and wind power in the early 2030s, covering Denmark’s entire gross energy consumption.

However, it must be assumed that part of the renewable energy will be exported to our neighboring countries, and we will see an expansion in PtX plants. If GTD's energy efficiency action plan is coupled together with a moderate PtX expansion (at the lower end of the Danish Energy Agency's scenario), it will be possible to keep the total energy consumption of the society below 700 PJ – corresponding to approximately 194 TWh.

The Rebound effect must be addressed

A national action plan for energy efficiency requires a targeted effort to change the behavior among citizens and companies to minimize the rebound effect. This is a real risk.

For example, when houses are better insulated, citizens often tend to turn up the heat, while people with electric cars may be tempted to drive further because the price per kilometer is lower. There are many explanations for why people change their behavior as more energy efficient technologies are implemented, but it is not impossible to address this challenge.

People also respond to price mechanisms, and during the energy safety crisis, we saw how citizens saved energy as energy prices increased. The risk of a rebound effect can possibly be addressed by increasing the CO₂ tax further or by implementing other incentives to save energy.

GTD therefore recommends that a more thorough analysis is conducted, to study how we can limit the rebound effect in Denmark with the use of targeted incentives. A consolidated energy saving effort should be made to realize the full technological and economic potentials of energy efficiency on a larger scale.

In contrast, if no targeted effort is made to ensure energy efficiency, and Denmark continue with business as usual with continued growth, there is a serious risk that Denmark's total energy consumption will increase with 50 percent or more by 2050. This will not be economically cost-effective, and at the same time, such a *business-as-usual* growth scenario will require even greater expansion of renewable energy both onshore and offshore.

Therefore, GTD recommends that a targeted effort to save energy is made now, so that the total costs of a

sustainable transformation of the energy sector are kept at a reasonable level. The energy crisis has shown that Danish households and companies are capable of making great behavioral changes rapidly. But it requires persistent energy saving efforts and proactive economic incentives to reach the goal.

International studies have shown that there is a risk of a rebound effect of 30-50 percent, that can undermine some of the benefits¹³. It is important to address this challenge as well. See text box.

Proposals for a strengthened effort for energy efficiency

In the new Energy Efficiency Directive, the target is set for a reduction of the EU's energy consumption of 11.7 percent in 2030 compared to the expected energy consumption in EU's 2020 projection.

It is GTD's opinion that this target is considerably lower than what is technically and economically optimal. Therefore, GTD recommends that Denmark sets a more ambitious goal for 2030 and maintains an ambitious implementation of the energy saving targets.

Based on Danish and international analyses¹⁴ GTD estimate that it is possible to reduce the current energy consumption by at least 23 percent by 2030 compared to 2019 in Denmark. If the energy intensity per GDP unit increases by at least 4 percent annually, and the economic growth is kept at a maximum of 1 percent annually, it is possible to save more than 40 percent of the energy consumption by 2040 compared to today.

Based on this, GTD recommends a number of concrete actions:

1. Adoptions of an action plan on energy efficiency in Denmark

There is a need for a long-term and coherent effort for energy efficiency that includes all sectors. Therefore, it is important that the government presents a long-term action plan for energy efficiency.

The action plan should include:

Clear reduction targets for the total energy consumption in Denmark in 2025, 2030, 2040 and 2050. The gross energy consumption (excluding energy for future PtX plants) should be reduced by 23 percent by 2030 and by at least 40 percent by 2040 compared to 2019. The energy consumption should be reduced by at least 50 percent by 2050.

The energy savings effort should include clear and specific targets.

- **Sector targets** for the energy consumption in each sector to ensure progress in all industries.
- **Economic measures.** The action plan should include a description of the economic measures (taxes and fees) planned to be implemented to give companies and citizens incentives to increase energy savings.
- **Specific sector-related plans.** The plans should include a review of the measures planned to be implemented in each sector (transport, business, buildings, etc.)
- Ensure energy efficient development of Power-to-X plants, so that surplus heat from the plants is utilized. Additionally, stringent energy standards should be defined to favor the most energy efficient plants.
- Set clear goals for electrification of the industry, transport, and the heating sector, as this can result in large energy savings compared to operation with diesel, oil, and gas.
- The plan should be reviewed every year in line with assessing the progress of climate action. Corrections should be made if the progress on energy efficiency deviates from the expected, as the energy savings effort is crucial for reducing Danish CO_{2e} emissions year after year.

2. Taxes and fees

A high, uniform CO₂ tax of at least 1500 DKK per ton CO₂ should be adopted for all sectors. The industries already covered by EU Emissions Trading System (ETS) that have already paid for the purchase of CO₂ quotas will receive a deduction for this amount in their CO₂ tax.

The energy taxes will be revised, reflecting the increase in CO₂ taxes, where the energy taxes are reduced as the CO₂ tax is increased.

Electricity taxes are adjusted to ensure that already electrified areas continue to have incentives to reduce electricity consumption. A low electricity tax can help accelerate the transition, and until larger parts of the Danish heating sector, industry and transport is electrified, the electricity tax should be kept at a low level. One might consider strengthening incentives for energy savings through differentiation. For example, a standard deduction could be implemented for the first 4000 kWh, after which the marginal electricity consumption is taxed at a higher rate.

An analysis on the possibilities of making the property taxation green should be conducted, so that taxes for energy efficient buildings are reduced.

The Danish government should at EU-level prioritize the following efforts:

- Implementation of an import CO₂ tax (CBAM = Carbon Border Adjustment Mechanism) for goods imported into the EU. Any national exceptions for CO₂ taxes on energy intensive companies are minimized and subject to review in line with the progress of CBAM.

3. Measures for the business sector

Since 2020, the efforts for energy savings in the business sector have been based on subsidies. In 2021, a subsidy fund of 600 million DKK was allocated. Only 196 million DKK of this fund was used. Previously, the efforts have been based on requirements for the electricity grid

companies and other energy companies to implement energy savings.

In 2020, energy companies within electricity, natural gas, and district heating, spent just over 1 billion DKK on energy savings, which resulted in energy savings of 2864.9 kWh that year, corresponding to an increase of 0.9 percent compared to the previous year¹⁵.

This indicates that the extent of energy savings has fallen drastically since the introduction of the subsidy system.

Thus, there is a need to rethink the effort. GTD proposes:

- Requirements regarding compliance with certain technical standards for certain energy-intensive companies. There is significant potential for energy efficiency through compliance with standards in energy-intensive companies or companies with high energy consumption. This applies to heat recovery, ventilation, advanced control, etc. Consideration should be given to whether these requirements can be established as a part of the environmental approval for companies.
- Requirement for the implementation of energy management according to specified standards in certain companies with a high energy consumption. It is part of EU's Energy Efficiency Directive that companies with energy consumption exceeding 85 TJ implement energy management systems. This will only apply to a limited number of companies. Therefore, a national requirement for energy management should be introduced, encompassing a larger number of companies in Denmark, e.g. 50 TJ.
- Companies that do not implement energy management are obligated to carry out energy audit every 4 years. This is already included in the EU's Energy Efficiency Directive. Companies with energy consumption below a certain level are exempt from this requirement.
- Until the EU's system of free allocation of allowances for companies included in the ETS is

abolished, companies required to implement energy management or energy audit must receive deductions in the allocation of free allowances if they do not carry out energy efficiency measures with a payback period of less than five years.

- Requirement for new companies with a large potential for surplus heat to be located in areas where the surplus heat can be utilized in other companies or for district heating. This requirement will apply to, for example, data centers and onshore plants for PtX.
- Establishment of a knowledge center for energy efficiency in manufacturing companies. The function of such a center will be to collect and disseminate knowledge about energy efficient production processes to Danish companies, especially medium-sized and small companies. The center should, among other things, provide guidance to manufacturing companies and companies that provide services to manufacturing companies on energy-efficient methods, including heat recovery, control, new technology, etc.
- A strengthened guidance and advisory effort for business companies to carry out energy savings and electrification should be introduced.

4. A. Measures for buildings

AAU Build has published an [analysis](#), that demonstrates the potential for a 20-30 percent reduction in the energy consumption for heating and hot water in the existing building stock through the ongoing renovations¹⁶. The large range in the reduction potential reflects uncertainties in whether the savings will result in increased comfort by raising room temperatures.

Inefficient buildings are potentially a barrier to low-temperature district heating, and it will require larger individual heat pumps unless the energy condition of the buildings is improved. A few critical, inefficient buildings can

prevent an entire district heating network from lowering temperatures.

To realize the potential for reduced energy consumption in heating and hot water, the following should be implemented:

- Requirements for energy efficiency in buildings are established for 2030, 2040 and 2050. The requirements vary based on building type, age, and current condition. The aim is to phase out the lowest energy classes G and F while introducing requirements for the improvement of buildings in energy classes B to E, gradually raising their standards. The level of requirements is determined through an analysis of improvement possibilities.
- Energy efficiency requirements can be enforced through the energy labeling at the sale of a building after the year in which the requirements are introduced. If a building does not meet the requirement, the new owner is required to upgrade the building within two years of acquisition. This will naturally result in the costs for the new owner being capitalized in the property price.
- For buildings in the rental sector, the requirements are implemented by prohibiting the leasing of buildings/apartments if the energy label indicates that the requirements are not met.
- Extended guidance/advisory service is introduced to support building owners in renovating buildings.
- Increase the support for private energy renovations in 2024 and gradually decrease support in 2025-2028. Subsidies for building improvements should be targeted at economically vulnerable citizens and buildings in areas with low property value, where real estate financing for building improvements is not possible.

4. B. The public sector as a frontrunner

The public sector should take the lead, and the energy performance of public buildings should partly serve as examples to be followed and partly contribute to stimulating the market for energy efficiency in buildings. At the same time, there is a great need for improving the indoor climate in day-care centers, schools, educational institutions, administration, and other public buildings, where many people spend a significant amount of time.

The following should be implemented for public buildings:

- The EU Commission's proposal for the new Energy Performance of Buildings Directive includes that all public buildings should be constructed as zero-emission buildings from January 1, 2027. GTD proposes that Denmark takes the lead and implements this requirement already starting from 2025.
- Establishment of special requirements for the energy performance of existing public buildings in 2030, 2040, and 2050 that are more ambitious than the requirements applying to other buildings. The requirements will also include indoor climate to ensure that indoor climate improvements are carried out concurrently with energy improvements.
- The financial limits of constructions and renovations for municipalities and regions should be eased so that investments in energy improvements and indoor climate are not included in the limits.

4. C. Better financing of energy renovation

If requirements for the energy performance of buildings are established, it is necessary to rethink the financing of building improvements, especially ensuring financially challenged citizens or citizens in sparsely populated areas with low or declining property prices are not disadvantaged compared to other citizens regarding the

implementing of energy improvements. A paper by AAU Build shows that there are approximately 50,000 houses where meeting the requirements of the EU Commission's proposal for the new Energy Performance of Buildings Directive will require renovation costs exceeding 50% of the property value¹⁷. Therefore, there is a need to conduct an analysis of the area and consider new financing mechanisms. This may include freezing loans in property value, offering takeover of properties with significant renovation needs to renovation companies for renovation and subsequent resale or rental, increasing the ceiling for real estate financing for energy renovation, etc.

There is also a need to strengthen financial institutions' incentives to support the green transition. Therefore, it should be examined whether green requirements should be introduced in loan portfolios of banks and financial institutions to ensure that an increasing share supports the green transition. The EU's taxonomy can serve as an instrument for this purpose.

4. D. Release of data and information

Access to data on energy consumption, the energy characteristics of the buildings, weather conditions, etc. leads to reduced costs of energy improvements, while it creates more opportunities for energy efficiency through better control, automation, etc.

Furthermore, access to data provides better opportunities to develop information tools to inform citizens about the energy and CO₂ impact of their consumption choices.

Therefore, the following should be implemented to ensure better access and use of data:

- Citizens should have easier access to receive detailed data on their consumption of heat, electricity, and water from utility companies. This could, for example, be established by developing a common public consent system through which citizens can partly request to receive their data from utility companies, and partly give consent for their data to be sent to a third party in case

of receiving a service that requires access to data.

- Setting requirements for district heating and water companies to develop systems for informing citizens about their consumption, similar to the requirements that apply to electricity, where any consumer can access their electricity consumption on an hourly basis.
- Development of data platforms for visibility of data for citizens and companies

5. Measures in transport

In an action plan for energy efficiency, it is crucial to save energy in the transport sector, which is heavily dependent on fossil fuels. The transport sector accounts for more than 80 percent of the Danish consumption of oil while it accounts for one third of total greenhouse gas emissions.

Electrification of the road transport is the most important and rapid measure to reduce the CO₂ emissions and total energy consumption of transport. Electrification liberates us from the dependence on fossil fuels, and at the same time, electric cars are far more energy efficient than a car with a combustion engine. In a conventional gasoline car, only about 12-30 percent of the energy stored in gasoline reaches the wheels – while for an electric car this is typically around 77 percent.

Therefore, GTD recommends an acceleration of the electrification of the road transport. Already in 2024, we should adopt a national ban on sale of new fossil fuel private vehicles and cargo vans starting from January 1, 2025. Instead of the fossil vehicle fleet increasing with more than 130,000 private cars and 20-26,000 cargo vans annually, it is important to stop the lock-in on fossil transport. The average lifespan of cars is – corrected for leasing – 13.5 years¹⁸, and thus, there is an urgent need to speed up the transition if Denmark is to become independent of fossil fuels and reach climate neutrality.

Likewise, the sale of new fossil fuel trucks should end from 2035.

The government's ambition is for Denmark to reach climate neutrality by 2045, but if phasing out fossil fuel cars is postponed to 2030, private cars alone will emit 500,000 tons of CO₂ in 2045.

From this point forward, all Danes who wish to buy a new car should invest in an electric car, as they are far more energy efficient than fossil fuel cars and hydrogen cars, which have much greater energy loss. Currently, transport in Denmark emits around 12.4 million tons of CO_{2e} annually, of which cars and cargo vans alone account for 8.3 million tons. Introducing a ban on sale of new fossil fuel cars is expected to reduce the annual CO₂ emissions by up to 350,000 tons by 2025 and 1.8 Mt by 2030, while also reducing the import of fossil fuels by more than 10 million barrels of oil. A more rapid electrification of road transport will increase electricity consumption by around 9-10 TWh in 2030¹⁹. This demand can be met through a faster expansion of solar and wind power, which will allow Denmark to become self-sufficient in green electricity for electrified land transportation.

Therefore, Green Transition Denmark recommends that the planned road taxation of trucks from 2025 is supplemented by also including cargo vans from 2027 and private cars from 2030 – a rapid implementation of emission-differentiated road pricing for both light and heavy transport, since this will cause effective driving patterns and electrification, as well as allowing higher taxes in densely populated areas compared to elsewhere.

In addition to the direct stop on sale of fossil fuel cars and the implementation of road pricing, there are several measures that can reduce the energy consumption in transport. For example, it is possible to expand zero-emission zones and thus accelerate the electrification of the vehicle fleet, or to increase the CO₂ component in the fuel tax to encourage more energy efficient driving patterns. Also, it is possible to eliminate cross-border shopping by increasing the diesel tax to at least the German level. Green Transition Denmark also encourages to double the rate of the registration tax 'Supplement for CO₂

emissions' for cars with emitting over 117 gCO₂/km, thereby increasing the costs of fossil-fuel SUVs.

It is also recommended to reduce the speed on highways, which has several positive side effects, as it can save on energy consumption, reduce air pollution, and decrease healthcare costs related to traffic accidents. GTD recommends – as also suggested by the International Energy Agency, IEA, and in the European Commission's REPowerEU plan – that the speed on highways is reduced by 10 km/h, which can save more than 5 percent of the fuel consumption.



Green Transition Denmark is an independent environmental organization that works to promote a green and sustainable transformation of society. We do this by creating and disseminating knowledge about green solutions and by influencing politicians, companies and citizens to make green choices.

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