

Report on national good practice scenarios for better NECPs



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Legal notice

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It is the overarching goal of the LIFE programme to act as a catalyst for changes in policy development and implementation by providing and disseminating solutions and best practices to achieve environmental and climate goals, and by promoting innovative environmental and climate change technologies.

The information and views set out in this report are those of the author(s) and do not necessarily reflect the official opinion of the European Commission.

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List of acronyms

AKIS	Agriculture knowledge and innovation systems
CAP	Common Agricultural Policy
DH	District heating
EE	Energy efficiency
EPBD	Energy performance of buildings directive
E.S.Co	Energy service company
GHG	Greenhouse gas(es)
HDV	Heavy duty vehicle
IPCC	Intergovernmental Panel on Climate Change
NAP	National allocation plan
NECD	National emission ceilings directive
PV	Photovoltaic (solar panels)
RES	Renewable energy source
SME	Small and medium-sized enterprise

Introduction and context

In 2018, the European Union agreed on the Governance of the Energy Union and Climate Action Regulation, which sets the way that EU Member States should contribute to the joint decarbonisation of the European economy.

The Regulation sets the rules for the National Energy and Climate Plans (NECPs), which represent each country's roadmap to reduce emissions in all sectors, contributing their fair share of the EU's joint effort to achieve climate neutrality.

In June 2019, the European Commission published its recommendations on the draft NECPs, asking Member States to fill the ambition gap for both the EU renewables and the EU energy efficiency target as well as improve the quality of the policies and measures presented in the draft NECPs.

Lessons learned from good practices around Europe can inspire and need to be considered in the finalisation of the NECPs. NGOs, Civil Society Organisations and all interested stakeholders play an essential role in identifying and raising awareness on various good practices that show the pathways towards climate-neutrality and form the foundation of strong and effective implementation

Navigating the link between good practices and national energy and climate scenarios is easier if a number of guidelines are considered. This document compiles basic ground rules on how to make sure the scenarios of the NECPs reflect good practices on agriculture, transport and buildings.

1. Why do energy and climate scenarios matter for the NECPs?

Energy scenarios sketch out a framework for future energy alternatives based on different combinations of policies and tools, technology options and awareness-raising activities. They are meant to be inspirational and to be used to tune intermediate targets and policies mix accordingly, making use of the existing tools and possibilities.

In the PlanUp Project we build scenarios on the base of best practices that have been previously selected and singled out. Some of these best practices are related to five reference countries which are not the target countries of the project and are there only to provide further inspiration to policymakers.

For the target countries, we have selected the two most relevant best practices for each sector for each country and we have built a sector scenario accordingly.

The ideal outcome of this exercise is to provide guidance to further structure NECPs towards the best combination of policies and technologies that will best accompany Member States authorities towards a path of decarbonization and to reach the objective of the NECP itself in the quickest and most effective way. This is relevant because the plan is meant to provide guidance for public investments in all Member States, together with the updated climate policies of European financing measures and body such as Multiannual Financial Framework and the European Bank of Investment, that dovetail national efforts in financing the change towards climate neutrality.

At the same time, these scenarios are relevant for private investors as well, as the identified public spending priorities will highlight technologies and sectors that will see important developments and economic growth in the

coming years for the sake of them contributing greatly to the objectives of the NECPs

Typically, decision-makers will want to use scenarios to shape plans for infrastructural investments, as these decisions are normally meant to steer the energy policies of a country in one direction or another. On average, these investments have a long lifetime and long payback times (pipelines, new electrical grids, power plants etc.) and may end up presenting a lock-in effect if the wrong investment is made. The span of the window of opportunity we still have to tackle climate change in time before the tipping point would not allow for delays due to wrong investments with even longer payback time.

1.1. Ambition for 2030 is a prerequisite for climate neutrality

The IPCC has made it very clear that the objective of sticking to a temperature increase below 1,5 degrees Celsius will only be achieved if we act promptly. For EU and Member States, this means taking measures in terms of both infrastructures on renewable energy and policies on energy efficiency and awareness-raising right from the beginning of the new decade.

This is because the planning and setting up of relevant national and international infrastructures is a time-consuming activity and it has to be enacted as soon as possible in order to deliver results by 2050. The setting of a goal of climate neutrality by 2050, as foreseen by many countries now and as envisaged by the new European Commission is a driver for a change of scenario and all intermediate targets should be changed accordingly for different reasons

1. Keeping a low ambition target, not in line with 2050 would determine a much expensive and fast race to decarbonization after 2030.
2. Aiming for lower targets could lead Member States to invest in technologies that cannot deliver results in view of the expected carbon neutrality by 2050, such as investments in fossil fuels and fossil fuels-derived solutions. The risk of lock-in situations increases and the costs for public purses could be much higher than necessary.

3. Overall current 2030 targets are not only insufficient to limit climate change to 1.5 degrees Celsius *per se*, but they also delay pathways to climate neutrality thus seriously risking to undermine their efficacy.

Lastly, the definition of ambitious long-term targets helps investors in the markets as it portrays a much more reliable outlook for investments in energy assets and infrastructures, depending on long-term visions.

Besides the ongoing revision of the NECPs, that will take place until mid-2020 according to the planning released with the [European Green Deal](#), the latter also contains relevant information that relates to climate policies of Member States. More specifically, It enshrines carbon neutrality as a target to be achieved by 2050 thus implying that all mid-targets should in some way align with a more long-term strategy.

This long-awaited commitment is also cited here and there in the document as an inspiration for 2030 targets and as a driver for ambition.

It is also one of the reasons why this document has been published in December 2019.

2. Why good practices matter for NECPs?

2.1. Best practices – How to inspire action

Although the key changes that need to be achieved are well understood for many areas of climate mitigation, there are multiple ways of achieving these changes and measures vary from economic incentives to awareness programmes or investments of the public sector.

To help to identify effective ways of cutting GHG emissions in the three sectors of the PlanUp project, the aim is to gather ideas on measures that

have found acceptability among citizens and facilitate exchange of inspiration and learning among public authorities that are responsible for designing policy.

As part of the PlanUp project we carry out a collection of best practices across Europe to help public authorities and civil society engage and discuss the best ways to deliver change in their sectors and accelerate action in line with the objectives set in the NECPs.

The collection was done based on a targeted literature review, collecting the criteria identified by other projects including LIFE, Horizon 2020 and other international projects, as well as the criteria identified in research to determine best practice policies and measures. The criteria focus on the aspects of efficacy in reducing emissions, cost-effectiveness, replicability, relevance, and co-benefits to other policy areas, crucial for the political acceptability of measures.

In order for a measure in the transport, buildings and agriculture sectors to be considered as a suitable good practice for PlanUp, we have established the following selection criteria.

<u>Criteria</u>	<u>Description</u>
Environmental outcome	The extent to which the good practices contributes to the objectives of the EU's 2030 climate and energy targets.
Economic outcome including financing aspects	The economic attractiveness of the measure for investors and public authorities.
Technical excellence and innovation aspect	The contribution to the market penetration of best available technologies and other innovation aspects.
Acceptability and participatory potential	The level of political support from decision-makers, public acceptance and involvement of non-state actors,
Co-benefits	The contribution of the measure to environmental and societal objectives.
Compatibility with a net-zero emission economy	The contribution of the measure to achieving a net-zero economy
Replicability	The extent to which replication is possible, and at which level (EU/national/regional/local)

These 7 criteria are underpinned by a total of 14 indicators.

Criterion	Indicator
Environmental outcome	GHG emission reduction potential or alternatively
	efficiency improvement
	shift to renewable energy
	circular economy contribution, resource use and waste reduction effect
Economic outcome including financing aspects	Economic attractiveness of the investment as defined by the payback period
	cost-effectiveness from a societal perspective (marginal abatement cost curves)
technical excellence and innovation aspect	Performance of measure in relationship to BAT, BREF, technological potential
	contribution to, decentralisation, electrification and storage, new business models, behaviour change, new actors,
Acceptability and participatory potential	Contribution of non-state actors
	Level of ownership within the public authority in charge
Co-benefits	Co-benefits including social benefits job creation and skills potential
Compatibility with net-zero scenarios	compatibility with net-zero scenarios (yes/no)
Replication potential	Information availability
	Market potential, possible market penetration at the national level

The identified good practices have been discussed with national stakeholders as part of the national capacity building workshops organised as part of PlanUp. This is considered an ongoing exercise, therefore this collection will be complemented by further good practices specific to the five focus countries and beyond.

The examples are made available to national policymakers in all EU Member States, so they can contribute to the promotion and development of a common understanding of effective and ambitious climate and energy policies and measures in the agriculture, transport and building sectors.

An important step of this project constitutes the cross-country exchange on good practices between civil society representatives and policy experts as part of the regional exchange workshops that are carried during the last leg of the NECP finalisation process. A broad discussion of available good practice examples is essential to stimulate replication across EU Member States and ensure the uptake in the NECP implementation.

2.2 Tools for useful input: how to identify a good policy measure?

As part of the PlanUp project we're developing tools that can help in providing accurate input, for instance by assessing the strength and potential of measures in the sectors of scope.

The [EU Calculator](#) is an initiative financed by Horizon 2020¹. EUCalc is a novel and pragmatic modelling approach situated in between three different types of models:

1. Simplified, synthetic and user-friendly models aimed at the general public;
2. Sector-specific, detailed models aimed at addressing issues related to a single sector;
3. Complex energy models accounting for the links and feedbacks between energy and economy.

It introduces an intermediate level of complexity (while keeping full scientific robustness) and a multi-sector approach that has been challenged and validated through technical workshops with sectoral experts.

¹ <https://ec.europa.eu/programmes/horizon2020/en>

The model makes and shows the relationship between GHG emissions and societal lifestyles and policies in all sectors involved in the PlanUp project (transport, agriculture, buildings) which are driving energy consumption and GHG emissions.

3 Horizontal remarks

The analysis of the presented draft NECPs offers a very useful insight into whether Member States are putting the issue of energy and climate at the centre of their political and economic agenda or not. Some key findings are resumed here:

- The EU has committed to phasing out inefficient fossil fuel subsidies by 2025 through the G7 (G7, 2017) and reiterated its commitment to phasing out inefficient fossil fuel subsidies every year since 2009, through the G20 (G20, 2016). Unfortunately, all NECPs presented so far failed to present a plan to phase out subsidies to fossil fuels. Some countries (UK, DE, GR, SL, PO, PT)² are still discussing the introduction of new fossil fuel subsidies, despite this being completely inconsistent with the goal of the plan;
- Many plans fail to define what are the measures they intend to put in place to achieve their expected climate results;
- Some of the measures presented in the plans are not consistent with the objectives: the link between the ambition of the measures and the overall target is sometimes not clear or simply it is not there;
- Most countries fail to properly address the role of agriculture in climate policies. This sector's contribution to climate mitigation has long been neglected and policies on carbon storage through e.g. a change in cultures and agricultural techniques are more an exception than the rule;
- On the other hand, some countries pledged to use these plans to pave the way to achieve climate neutrality in 2050;

² [Fossil fuel subsidies in draft EU National Energy and Climate Plans](#), FoE NL, CAN, ODI, Sept. 2019

➤ 4. Going climate neutral in the transport sector

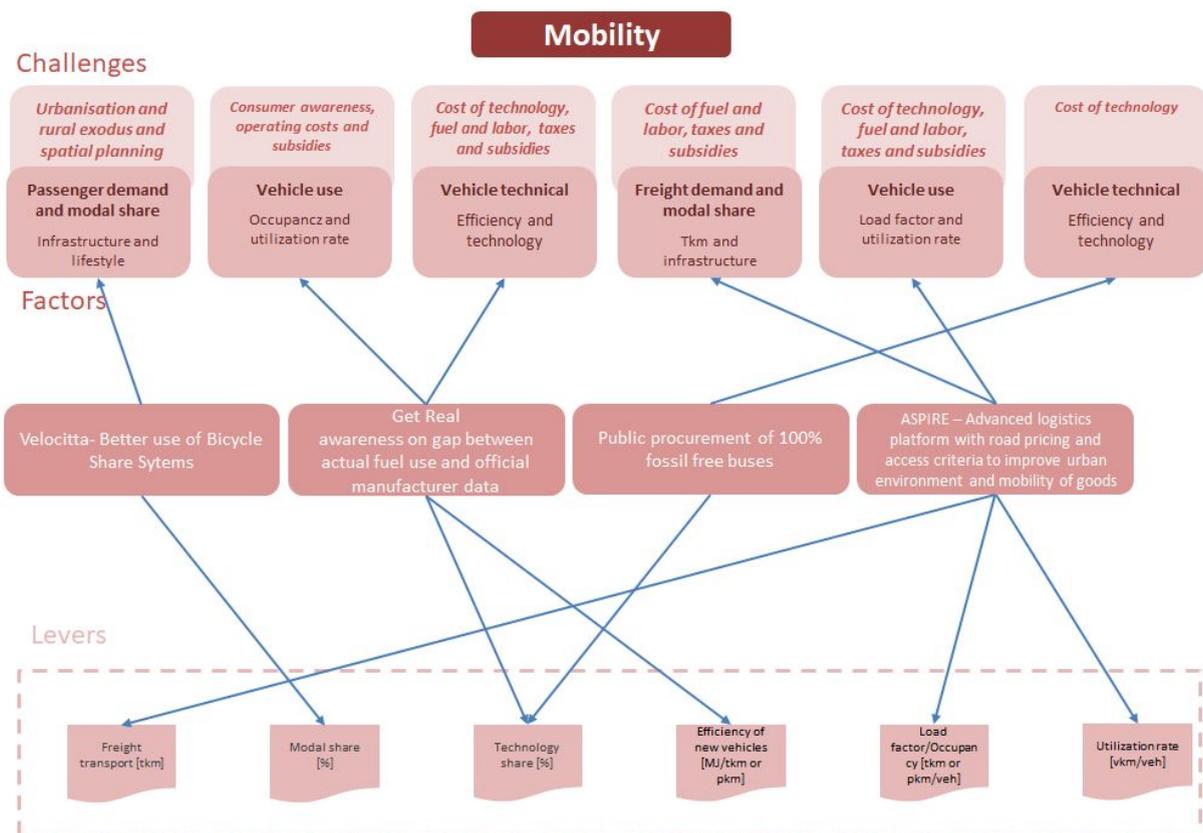
4.1 Suggestions and indications from reference countries

For the mobility sector the mobility demand, modal share, use and efficiency of the vehicles (both for freight and passenger transport) are the main parameters.

While urbanisation and spatial planning play a major role for passenger demand and modal shift, transportation costs and economic framework of different modes of transport are the major aspects for demand for freight transport.

The development of vehicle technologies is subject to EU legislation and shows significant untapped climate mitigation potentials. On the aspect of vehicle use for individual passenger transport, both the economic framework of fuel costs and subsidies as well as the consumer awareness and availability of alternative modes of transport play a major role.

All of those factors also reflect one or a number of challenges related to the economic and legal situation and or societal and economic trends that drive or inhibit certain actions. The list of challenges below is not exhaustive but exemplary of the bottlenecks and shortcomings that need to be addressed with best practices.



The Velocitta - Better use of Bicycle Share Systems³ has been implemented in a number of cities across Europe spanning from Spain, Italy, Poland, UK to Hungary in the years 2014 - 2017. The measure was initiated on initiative of the local authorities and is not based on other legislation. The involved municipalities include Lambeth municipality, Southwark Council, Krakow municipality, GoodBike Padova, City Cike Szeged, and BiciBur.

The aim of the initiative is to identify and remove market and organisational barriers by applying strategies and methods that have already been proven effective in stimulating behavior change through segmented marketing and operational enhancements. To change the travel behaviour of the public, the initiative combines two complementary approaches: a) Utilisation of user segmentation techniques to overcome perceptual and/or attitudinal barriers (such as targeted campaign for white collars working in the center and/or for university students) and b) Adoption of the most effective available operational solutions with regard to financial organisation and political involvement to improve the performance of the BSSs (such as improvement of the App and geolocalization services).

³ <http://velo-citta.eu/>

The Get Real awareness campaign⁴ is a collaboration between two civil society organizations: Environmental Action Germany (DUH) and Transport & Environment. The campaign addresses shortcomings of existing standards and regulations in the transport sector and targets citizens and policy-makers through an awareness campaign. The objective is to inform the general public about the existing gap between actual fuel consumption figures and official manufacturer data for passenger cars. Get Real is working to ensure that the manufacturer's data correspond to reality. The bottom-line message of the campaign is that climate-damaging emissions must be reduced in real terms, not just on paper: the duping of consumers that has been going on for years must be stopped.

4.2 Suggested scenarios for Hungary based on best practices

In Hungary, there is plenty of potential for the NECP to improve the situation in the transport sector. A scenario where Hungary would align with, at least, the average EU performance for CO₂ emissions in the transport sector would entail the implementation of a series of horizontal measures such as:

- Include a transport-specific GHG emission reduction objective of 25% by 2030, and accordingly an objective for each year until 2030, in order to track the sector specific emission reductions. Currently, the NECP assumes a 50% increase in transport emissions by 2030;
- Increase the share of electric vehicles to be in line with the EU target, and consider the types of vehicles most adequate for reducing GHG emissions in cities;
- Include measures and policies to address emissions from heavy-duty transport. As a minimum, the plan should align to the EU requirements for CO₂ standards for these vehicles, but other measures should be considered such a modal shift (see below);
- Implement road charging schemes (i.e. as in London or Milan);
- Include provisions for aviation, which is largely ignored in the current NECP, such as the introduction of an air passenger duty (similar to those in Germany and the UK), and extend night flight bans. Calculations of emissions in the transport sector should take

⁴ <https://www.get-real.org/front-page-en/>

international air transport into consideration.

Promoting e-mobility

Like for the other sectors, the NECP plan for electromobility lacks financial backing. The NECP aims to have 450,000 electric cars on the road by 2030, but it is not specified what vehicles are to be prioritised and what vehicles are a target for substitution. The government today provides consistent subsidies for the purchase of e-cars, but the present system is very inefficient and socially unjust. The way the subsidy is set up favours wealthy citizens who are likely to buy an electric car as a second or third car, not in replacement of an existing one: this is likely to result in a lesser impact on emissions and fuel consumption as compared to a policy where subsidies were destined to public service cars, car-sharing and taxis. The electromobility association “Jedlik Ányos Klaszter” has put forward detailed proposals for the government to promote light electric vehicles, but so far these proposals have not been implemented.

Hungary would greatly benefit from investing in e-buses, e-car, and e-bicycle sharing systems and support for electric urban delivery system as well as the final replacement of diesel locomotives with electric ones on the railways. To attain an uptake of e-mobility in line with the average ratio of EU, the following policies should be put in place:

- Acceleration of the charging network’s implementation with the involvement of market stakeholders, and the establishment of conditions for travelling by electric vehicles in the country as soon as possible;
- Promotion of the use of electric vehicles by means of traffic management (free access to road pricing areas and highways, facilitated access to central parking etc);
- Increase the cost of urban parking for fuel-based vehicles;
- Establishment of long lasting incentives scheme and a legal framework that can allow for stable investments in the long term.

Mitigation of car usage

To effectively promote modal shift from private car to public transport, improving public transport is not enough. Car usage also needs to be regulated via a series of policies that internalize environmental damages into the ownership and usage cost:

- Road charging should be widely implemented: Ensure all tolls are inclusive of separate infrastructure and (air and noise) pollution costs so that more polluting vehicles pay more;
- Change the highways tolling system from time-based to distance-based for passenger cars, and extend it to all roads;
- Extend the toll charge for heavy duty vehicles (HDVs) to all roads so that the environmental damage they cause is accounted for wherever they drive. This will additionally prevent HDVs from using secondary roads to avoid the toll, and thus relieve congestion on those roads. Remove any time-based discounts that encourage inefficient transport behaviour and reduce the environmental implications of the charge.
- Modify the existing fiscal provisions for company cars in order to promote e-mobility and discourage the purchase of conventional cars.

In addition to these policies, to encourage car-pooling, the government should introduce city road pricing with measures to disincentive car travel such as more expensive parking, facilitate ride-sharing, and adapt fiscal incentives to deter private car use by ending tax benefits for company cars.

Fuel taxes should be introduced and tax reforms implemented. As a complementary measure to distance-based tolling, Hungary should engage in discussions with neighbouring countries to align their diesel tax rate to that of petrol and look to increase this to be more in line with the EU average. Collaboration on this measure is vital to avoid *fuel tourism* in which truck drivers divert to re-fuel in the country with the lowest fuel tax rate. This would decrease traffic in certain areas, and make it easier for neighbouring countries to use fuel tax as a tool to reduce greenhouse gas emissions.

Modal shift to cut traffic with 30% by 2030

In urban areas, the average number of passengers in a car is below 1,6. This leaves millions of free seats not used and cars circulate inefficiently while burning a huge amount of fuel with limited service to the community. An efficient support of carpooling, with a special focus on commuters, could mitigate the traffic by 30% in the agglomerations of the main Hungarian cities. This could remove about 100,000 commuting cars from the roads every [day](#).

There is already an increasing interest in carpooling which should be backed by the government as soon as possible by supporting it with consistent policies. A recent [report](#) shows that 49% of car drivers are either 'certainly' or 'probably' willing to share their car with one or more passengers. The same percentage of commuters would be willing to be a passenger in someone else's car. These are promising figures that might cut road traffic in main Hungarian towns substantially, thus increasing the efficiency of the car transport (in terms of fuel/people transported).

Improving freight transport

Hungary is a transit country. Shifting a significant part of transit heavy good vehicles to rail (RO-LA; i.e. as it has been done in Switzerland) is a good tool to mitigate the traffic on the main roads. This seems to be a much better measure than the recent extension of the m1 motorway with a third lane. Whatever the potential, the growth in freight rail is unlikely to materialise without improvements in rail capacity and improved customer service by rail freight operators, which should be sought after by creating an environment for competition.

This also is somewhat reliant on road charging, as the cost of road has to increase significantly to internalise external costs of road transport (such as air pollution, GHG emissions and infrastructure costs) into road transport.

In 2013, Hungary implemented an electronic distance- and pollution-based road toll for trucks with a permitted maximum weight over 3.5 tons. This scheme should be extended to all roads, and the toll should be substantially raised for all trucks worse than Euro Standard VI.

Other measures needed to improve the efficiency of freight transport include a funding plan for the renewal of trucks' rolling stock and repair and maintenance facilities as well as restrictions for heavy truck traffic (e.g. weekend bans, prohibition of using certain roads).

Increasing public transport capacity

Policies to shift passengers from cars to buses and trains can be divided into two broad categories: intercity travellers and metropolitan commuters. As roughly 70% of passenger train transport is concentrated in the agglomeration of Budapest, this makes the area a priority for public investments. Reliable train schedules, fair pricing and competitiveness with other modes, punctual services, and modern and well-maintained rolling stock (that can offer services such as wifi and clean toilets) must be ensured. While the quality of train service must be quickly improved to be appealing to commuters, the competing buses should also be regulated so they do not benefit from unfair competitive advantages: they can offer cheaper services than rail thanks to lower infrastructure costs (paid mostly by car and truck owners).

Buses should therefore not be granted discounts to road charging to ensure that they pay their fair share of infrastructure and societal costs (CO₂ emissions and air and noise pollution).

In cities, to shift car passengers to public transport, an essential component are low emissions zones. While a journey by car is typically characterised by door to door transport, a public transport journey is often part of a multimodal trip, and may involve walking or cycling to and from the public transport means. Although walking in itself will not be able to offer the same transport service as cars for relatively long distances, it is an integral element of facilitating the journey. Cycling enables short-distance trips to be largely replaced, especially with the generalization of electric bikes, making cycling a transport solution for more people.

4.3 Suggested scenarios for Italy based on best practices

Reducing emissions from the transport sector is of fundamental importance. Not only for climate purposes but also for reducing local air pollution and for a better quality of life for citizens, particularly in Italy's northern plains. Recent policies put in place in the Italian northern plains such as the coordinated inter-regional plan for air quality, have focus on

temporary peak-time solutions and have not achieved any meaningful improvement of air quality and traffic.

Several measures for the transport sector could be integrated into the Italian NECP to contribute towards reduced emissions.

Electrification of public transport

Italy should strive towards a scenario of drastically reduced urban transport emissions by 2030 through the implementation of urban light railways and the use of the rich network of electrified suburban railways lines. Many Italian rural and suburban lines still operate on diesel: this not only brings a negative impact on local and global emissions but also prevents those lines to reach competitiveness with private mobility and thus prevents the modal shift of commuters.

Indeed Italy can draw on the experience of other European cities, where electrification of public transport has led to significant CO₂ reduction, especially if this electrification has come at the cost of diesel vehicles (as in Amsterdam).

Relevant Italian examples of improved mobility by electrification count the Arcisate-Stabio line, an international investment that bridged two existing lines and created a connection between the Canton Ticino area in Switzerland, the Italian town of Varese and the nearby airport hub of Malpensa. This has led to a strong increase in passengers for the train in the densely populated area, mostly passengers to the airport and commuters. The latest data indicate that over 4,000 passengers commute daily, with about 2,500 transboundary transits; the goal for 2018 was to reach between 3,000 and 4,000 passengers a day.

In Florence, the introduction of a new network of tramways has led to a sharp increase in public transport passengers. The first line alone carried 20 million passengers per year and has brought a CO₂ reduction of roughly 12,500 tons per year. This first line is estimated to have taken 9,300 cars off the roads every day.

Sectors coupling and promotion of shared mobility

Shared mobility experiences, such as electrical car sharing, have brought remarkable results in terms of modal shift from private ownership to shared mobility: as of today, 28% of the Italian population has access to some sort of shared mobility services and over 1 Million people use shared cars. Carpooling services count over 2,5 Million users. The city of Milan is today one of the cities in Europe with the highest number of shared mobility users, with 640,000 registered users out of a population of 2 Million.

This sector can also use existing infrastructure related to renewable energy such as distributed photovoltaic production, as roughly 30% of the shared vehicles are e-vehicles. Car, bike and scooter sharing, when operated with e-vehicles, depend on easy and cheap recharge to maximise vehicles use and to avoid technical downtimes.

A good measure to inspire the NECP is the [Sun2Car project](#), developed on the island of Sardinia. Sun2Car is a startup developed within the European Project RETIC by Sardegna Ricerche, a local research center. It designs and builds recharging networks for electric vehicles, distributed throughout the territory and powered by local renewable energy. The recharging network support the promotion of local communities by adding value to the charging time with suggestions and dedicated tourist-receptive services. It engages owners of small and medium scale Photovoltaic installations to provide energy to e-vehicles, thus creating an extended and bottom-up network of charging stations. The project allows users to recharge in full autonomy by smartphome 24/7.

Promotion of zero-emission urban mobility with targets

Italy lags behind in the implementation of low-pace mobility (bikes, skates, individual e-mobility and pedestrian paths/areas) and only large and mid-sized cities, mostly located in the northern plains of the country, have invested in such infrastructure. To achieve a scenario where low-pace mobility reaches 30% of the modal share, it is essential to invest in bike lanes and low emissions zones (with 30km/h speed limit) that enable

low-pace commuters to share the road safely. Two international examples of such policies are those of Valencia and Sevilla in Spain, where it was proven that the implementation of bike lanes must be carried out in a programmed, extensive and coherent network of lines that reaches out to the larger part of the urban population and connects the relevant traffic-driving areas of the city.

The Italian town of Pesaro hosts one of the most successful and relevant innovations in this field: the [Bicipolitana project](#). The name combines *Bici* (bike) and *Metropolitana* (metro) and it is a “surface metro for bikes”. In Pesaro, cyclists move along bike paths clearly identified by vertical and horizontal signals. The project counts on both infrastructure and communication, providing an overground grid where cyclists move as if they were in a metro network, with hubs linking the different lines, each of them numbered and defined by a colour and clear origin and destination. The main line of the network, linking the town centre with the coastal area, in summer serves the same amount of commuters as a urban bus line. Combining the system with the introduction of a free-floating bike-sharing system, the city has witnessed a steady increase in cycling. The amount of shared bike single users rose to 13,000 out of a population of 90,000. If applied to every middle-sized town in Italy, this could result in a steep increase of bike use in urban areas.

4.4 Suggested scenarios for Poland based on best practices

Though several policies are in place in Poland in the field of sustainable mobility, there is still ample room for improvement of the sector within the Polish NECP. The quality of the rolling stock is far from being ideal and the uptake of e-mobility is limited by cultural and structural obstacles that have not yet been tackled. Overall to achieve a scenario of full exploitation of the potential that this sector has to limit GHG emissions, an intense awareness-raising action must be carried out to improve the image of public transport and the appeal of the low-emission forms of mobility.

The following section suggests three types of measures that could strengthen the climate action of the NECP.

Promotion of zero-emission urban mobility with targets

Poland should promote a scenario where the share of bike in transport would grow from 1-3% to at least 10%, building on best practices that are being carried out in many cities in Poland, including Warsaw, Krakow, Gdańsk and many more. In these towns authorities are putting in place active bicycle promotion with the creation of local infrastructures, including quickly-growing bike-sharing systems. In urban areas the target for low-emission individual mobility should be at least 30%, in line with the best performing european experiences.

Improving the public and private car fleets

Poland has a difficult task ahead when it comes to upgrading the state of the private rolling stock because a great number of cars registered in Poland are indeed second-hand cars imported from abroad (mainly Western European Countries). It is critical to upgrade the average efficiency of these cars. The government has put in place an incentive scheme called “Get Real” that can potentially be an effective measure to achieve this result. Nevertheless, this measure alone will not be sufficient and it should be complemented by progressive environmental taxation of registered cars, clean car zones in cities and pollution-driven tolls on highways. A realistic scenario is one where, thanks to these measures, 25% of the fleet of polish cars will be less than 5 years old by 2030. All procurement of public cars, on the other hand, should be restricted to e-vehicles only.

Electrification of the bus fleet

Although the interest in e-buses is high in Poland (Warsaw has just bought 150 of such buses), targeted policies are needed to achieve a scenario where this is the default choice for Green Public Procurement. The obstacles that public procurers face when buying e-buses are related to the higher upfront cost, only balanced by a lower lifetime cost due to lower maintenance and longer life span of the e-buses.

Currently, with no external extra financing available for the e-bus, choosing e-buses over conventional last-generation diesel vehicles can lead to a

reduction of the fleet, a slower turnover ratio or higher mortgages and therefore higher costs of service. This situation is making it difficult for e-buses to fully reach the potential they have.

The main obstacle is a financial one. A scenario of a 30-50% electrification of the bus fleet is conceivable if transport companies are provided with either financial incentives (e.g. cooperation with E.S.Co and/or producers) or incentives that allow them to procure e-buses without the risk of shrinking the service (buses are the backbone of urban public transport in Poland).

4.5 Suggested scenarios for Romania based on best practices

A scenario of successful decarbonization of the Romanian transport sector will require coordinated action between the state, the private sector and the public in order to guarantee that actions along all the lines of the NECP strategy are coherent and synergistic. Such a scenario is complicated to create, but the following sections offer some suggestions of elements that could be included in the NECP to enhance climate action if included in a coherent way.

‘Polluter pays’ principle across transport modes

As a general horizontal criteria, we suggest that authorities in charge of NECP will continuously update the scenarios based on life cycle analyses of all vehicle categories and, following the principle of the “polluter pays”, encourage the use of transportation modes with the least environmental impact. The principle should be applied to road traffic, rails, waterways and flights alike, to incentivise the expanded use of railways and waterways.

Update of infrastructure

Romania once had one of the densest railway networks in Europe but currently, both rails and carriages are suffering from lack of investments with trains often circulating at a top speed of 40 km/h. The same is true for waterways. The Danube river is used intensively by a number of EU countries but Romanian ports along the river are in dire conditions and need major investments. Policies for reconstructing the environment along Romanian rivers and lakes must also be adopted, finding inspiration in good cases from, for example, the Elbe river. In order to enable this mode of transport to become a real alternative to freight air carriers and road traffic, national policies must target major improvement in getting the infrastructure up to speed.

Incentives and improved infrastructure for electric vehicles

To encourage an accelerated transition from fossil fuel-driven vehicles to electrical vehicles, it is crucial to provide a comprehensive infrastructure for electric vehicles as possible alongside the ongoing “*Rabla plus*” incentive scheme.

Re-purposing obsolete industry

With the large reduction of gasoline production needed, enormous industrial infrastructure and workforces will be rendered obsolete. One solution to this could be to use existing chemical platform facilities to produce chemicals, including fuels, from renewable sources and waste. The case of dimethyl-ether (DME) is already well documented. Producing DME from non-fossil sources holds the potential to target both the diesel problem as well as gases for refrigeration appliances, propellants for sprays, propane-butane for kitchen purposes etc.

4.6 Suggested scenarios for Spain based on best practices

In the current Spanish NECP there is ample room for improvements to the plans for the transport sector. A scenario of enhanced climate action in this sector can entail many priorities, but the section below offers some measures that could contribute to decarbonize the sector and achieve higher GHG cuts by 2030, in line with a more ambitious 2050 target..

Extend low emission zones

In accordance with a proposed Spanish National Law draft, the Spanish NECP encourages cities above 50,000 inhabitants to implement traffic restrictions. To achieve a scenario where low-emission individual mobility (bicycle, pedestrians, individual e-mobility) covers at least 30% of urban travels it is necessary that these provisions become compulsory by law and that they are accompanied by tools to support cities implementing it.

Should these policies become mandatory, situations such as the current one in Madrid where changes on local governments compromise best practices already implemented such as Low emission Zones and Zero Emission Zones, will most likely be avoided. The Madrid case can be considered a good example of initiatives that should be promoted in policy frameworks.

Starting from November 2018, the City of Madrid established traffic restrictions in a central area of near 480 ha within the framework of its Climate Change and Pollution Plan known as “Plan A”. The plan involved 30 measures to target pollution and climate change. The access to the area and parking rights depend on the emission class of vehicles. Cars without a label cannot access the zone. Plan A also included the promotion of public transport, new business models as car sharing as well as improvement of electric infrastructure to further the use of electric vehicles.

In March 2019, NO₂ emissions caused by cars were reduced by 38% and CO₂ by 14,2% in the LEZ area of Madrid, according to an “Universidad Politécnica de Madrid” study. According to the same study, in the whole

city NO_x was reduced by 9% and CO₂ by 2%. The project was supported by NGOs and a big part of the city population (some polls concluded up to 78% of the citizens were in favour of traffic restrictions).

Phase-out of fossil-fuelled vehicles by 2028

The current government of Spain has delivered two important regulations (Climate Change Law proposal and the Spanish draft of the NECP) that include a gradual phase-out from fossil-fueled vehicles to achieve zero-emission transport. The goal will be reached by disincentivizing the use of fossil fuels in transport and incentivizing the shift to zero-emission vehicles using renewable energy (electric, hydrogen, Power-to-Liquid). By 2030, a stock of 5 million electric vehicles should be reached in Spain, which would represent a 12% share of the fleet in 2030.

By 2040, the registration and sale of passenger cars and light commercial vehicles in Spain will be limited to vehicles with emissions of 0 g CO₂/km. This has been programmed in such a way that the automotive sector will not face a decreasing production level since it will gradually shift to the production of e-vehicles and their respective components.

However, this plan is mostly aligned with a business-as-usual scenario, as sales of diesel are already decreasing and, in a climate emergency context and with the existing technologies available, sales should be banned by 2028.

This is also meant to prevent a lock-in effect: given the fact that, in order to improve circular economy and lower material consumption, it is of key importance to extend the average lifespan of cars (currently 11,4 [years](#) in Spain) and should this be done with fossil-fuelled cars we would risk a lock-in effect. Moreover, should the ban not be anticipated the industry would not move to electrification fast enough and the GEI gap can be insurmountable.

In addition, a strategic plan for this phase-out has to be developed and managed through a coordinated “Mobility Platform” coordinated by the Presidency where Ministries of Industry, public works and ecological transition should be represented along with the civil society and the industry.

➤ 5. Going climate neutral in the Building sector

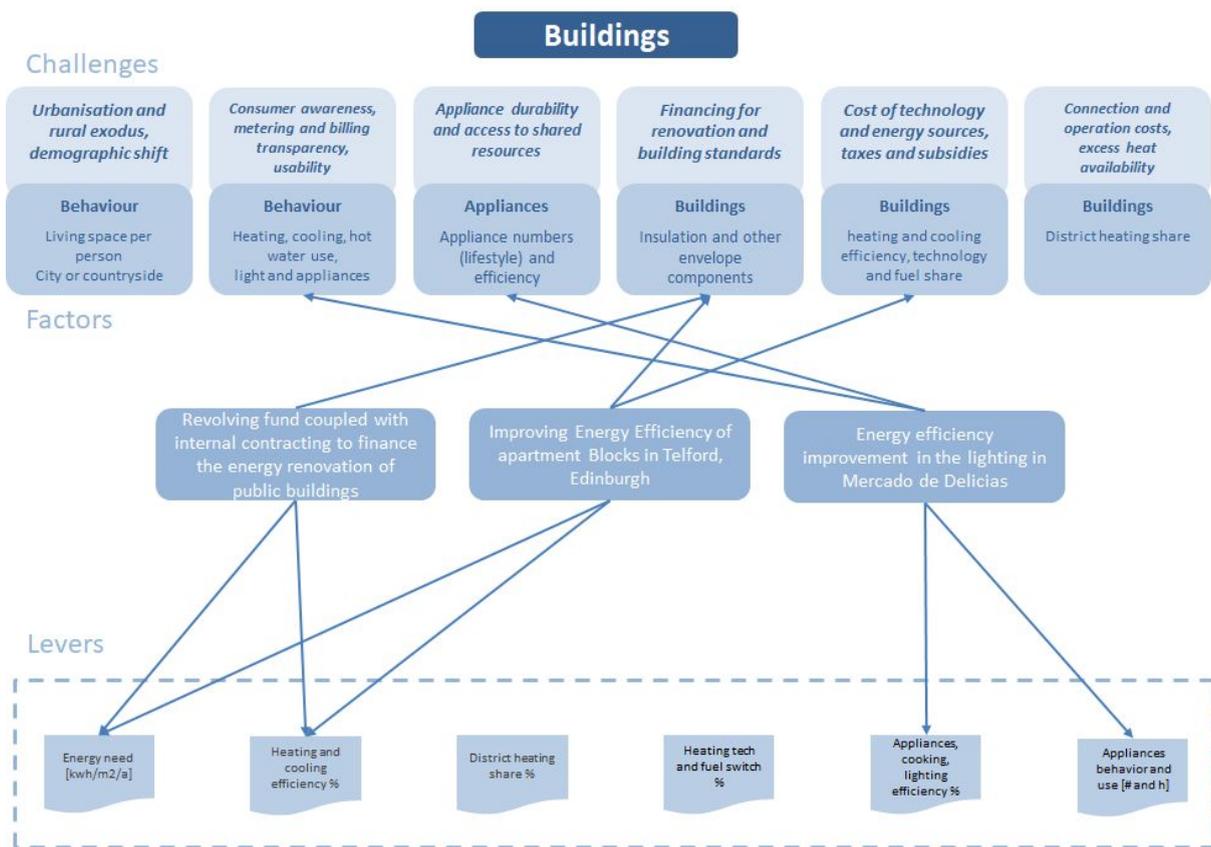
5.1 Suggestions and indications from reference countries

For the building sector, both the built infrastructure as well as human behaviour is essential in the decarbonisation of the sector.

On the behavioural side, the living space per person and the location of the building has a significant impact on potential mitigation potentials. On the operational level, the use of heating/cooling as well as hot water, light and appliances offer different climate action potentials. Of a more long-term character is the number and efficiency of appliances, which also reflects the level of affluence and access to shared resources.

On the building and built infrastructure level, the building structure and insulation and envelope components, heating and cooling systems efficiency, technology and fuel mix as well as the access to district heating and cooling infrastructure are decisive.

All of those factors also reflect one or several challenges that reflect the economic and legal situation and or societal and economic trends that drive or inhibit certain actions. The list of challenges below is not exhaustive but exemplary of the bottlenecks or shortcomings that need to be addressed by the measures and best practices.



The establishment of a revolving fund coupled with internal contracting to finance the energy renovation of public buildings has been started in the municipal departments of Almada, in Portugal. Almada's revolving fund "Almada Carbono Menos"⁵ aims at reducing the municipality's carbon footprint by financing particular investments in energy efficiency in public buildings, tackling the challenge of financing faced by many public authorities.

The most important innovation of this instrument of combining a revolving fund with internal contracting is the "shared benefits" approach, which encompasses different sharing schemes linking the fund and the "client department" based on the characteristics of the project. This ensures that the fund is replenished and gives extra motivation for different departments to invest in energy efficiency. A non-compliance procedure is also included, meaning that a client department can lose the shared benefit or even have a penalty imposed on their budget, if they fail to operate the system correctly.

5

<https://www.covenantofmayors.eu/news-and-events/news/1387-almada.-portugal-a-revolving-fund-for-less-carbon.html>

The measure managed to cut 953 tons of CO₂ emissions annually from 2009-2016 and reduce energy consumption by 3,000 MWh. With a total investment of EUR 1.6 million, nearly 10% of energy expenses have been saved.

The example of Improving Energy Efficiency of apartment Blocks in Telford⁶, Edinburgh was implemented in Scotland in the years 2015-2016. The measure built on the Home Energy Efficiency Programmes Scotland and a Scottish Government national retrofit initiative, used to implement Art. 7 of the Energy Efficiency Directive legal basis. Furthermore, additional funding was provided by Manor Estates for their properties and through the Energy Company Obligation (ECO), a UK Government funding stream, for private dwellings, also used to implement Art. 7 of the Energy Efficiency Directive. The two blocks are part-owned by Manor Estates housing association. For residents, the main motivations behind improving these blocks were to reduce energy bills and improve property appearance. Improving energy efficiency has historically been a challenge due to the mixed tenure nature of the flats and the concrete construction.

As part of the initiative, two communal measures were installed into the block: external wall and loft insulation. While the measure managed to reduce the CO₂ emission by 1.14 t per flat, reducing CO₂ emissions by 30%, the apartments are still using gas fired boilers. Further improvements of the envelope quality and a switch to renewable sources could be considered. As the project was able to benefit from full funding the residents did not need to contribute financially towards the work.

5.1 Suggested scenarios for Hungary based on best practices

Though some provisions in the NECP of Hungary are sound, to fully harness the possible savings and cuts on climate emissions derived by energy efficiency and renewable energy supply we suggest the following amendments and corrections.

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http://www.manorestates.org.uk/manor-estates-progress-external-wall-insulation/%20%20http://www.lowenergyapartments.eu/wp-content/uploads/2016/03/LEAF_Case_study_showcase_Scotland_D8.4_Feb16%E2%80%99.pdf

Define continued and dedicated funding

Though the plans for the building sector in the NECP are consistent with the targets, we suggest to identify stable and dedicated sources of revenues to support the needed investment in the sector, in order to make these plans achievable.

Concentrate on best-performing programs

The government should revise the potential of energy efficiency (EE) in every sector, raising the overall national target. To improve the national policy on EE we strongly advise to carry out a comprehensive assessment of existing EE program in order to evaluate the best-performing ones. For instance the tax recovery program for industrial energy users is indeed bringing results: however, more transparency is needed to assess whether this project is cost-effective and how it compares with others.

Stop the use of coal and lignite

The use of low-cost lignite mined in the country is an obvious obstacle to reach carbon neutrality in 2050 and the renewable energy sources (RES) target by 2030. We, therefore, propose that the mining and use of lignite shall be phased out in accordance with the other countries and in any case as soon as possible. All power plants using such fuel, like Mátra Power Plant, should be either closed or converted to RES.

To achieve such a result, an awareness-raising campaign on the air pollution topic would be of great help, in order to inform citizens about the need of this move to protect public health along with reaching the Paris agreement's target.

A different policy on energy price

Energy price for low-income families has long been a priority for the Hungarian government and rightfully so. But the centrally controlled price of energy does not distinguish low-income families by consumption and energy use, therefore it makes no distinction between need and misuse of energy. Indeed this policy does not help Energy Efficiency investments from the tenants and the landlords. More generally it undermines related national policies and discourages the creation of energy communities to promote RES and EE.

We hence propose that the Government launches a massive awareness-raising campaign for consumers (including the segment of low-income families), dovetailed with a strong improvement on transparency on bills: subsidies, taxes, distribution costs should be clear and allow for better family energy programming. The existing policy for low-income families should be overturned in order to lower the energy consumption of those families through a renovation program, supported by public incentives specifically targeted on low-income citizens.

Building on this, a revised administrative and legal framework should empower local authorities to put an end of use of waste burning as a thermal source for low-income families.

Empower citizens and SME

We believe that promoting the idea of citizens to invest in Energy Efficiency to take part in the decarbonization of the heating and cooling sector on a voluntary base is the best way forward. This policy should be based on clear and stable incentivisation schemes.

Energy communities should be strongly favoured, as the key element of local plans for RES and EE investments: Communities provide lower prices and awareness to their members and have proven successful in many countries in overcoming the difficulties of collective investment in real estate.

SME in the building sector also could benefit from such a policy by taking this opportunity to hit the renovation market which would benefit for a much greater demand than today, thus contributing to reaching the EE targets and paving the way to carbon neutrality in 2050

However, the ongoing program to promote energy audits in small and medium-sized enterprises (SMEs) via the consultancy of local governments has not disclosed any relevant results so far: further effort should be done to clarify the impact of such measures in the framework of the general effort to lower energy demands in all sectors.

Better promotion of RES in domestic and district heating

A scenario of largely self-sufficient heating and cooling districts in urban area can be attained by changing building codes and promote local and district use of renewable energy. Indeed Instead of promoting condensing boilers working on fossil fuels we would much advice to support the

uptake of RES-based district heating (DH) and the extension of it, along with increased insulation of the buildings connected. The EE and RES targets would greatly benefit from the provision that only heat pumps should be allowed in new buildings when not connected with the district heating. Moreover, the volatility of prices of natural gas can have a strong impact on consumption and thus undermine energy efficiency targets.

Sustainable biomass and geothermal energy (either via direct exchange or heat pumps) should be supported in new and existing district heating and should become the norm in new buildings and greenfield urban development.

The combination of deep renovation with efficient DH could result in geothermal energy to be sufficient for existing and future DH plans, thus providing a scenario of a large share of multi-storey residential and commercial buildings being supplied with locally sourced renewable energy and lowering hydrocarbon imports at the same time.

5.2 Suggested scenarios for Romania based on best practices

Implement Circular Economy in the building sector

The NECP as of now lacks provisions to foster circular economy in the building sector, while a strong emphasis on these policies could drive to a scenario of massive energy and material savings.

Building on the experiences of refurbishment and reuse of public buildings such as the ARTA Cinema in Suceava, we suggest that the first measures to be implemented should be those related to the design phase, as buildings as carbon sink are not yet there as a concept in the NECP: design phase plays a major role in the possibility of reusing buildings in view of extending their lifespan. Provisions of recyclability of the materials in buildings should also be put in place along with Green Public Procurement criteria.

In 2030, a compulsory target on material efficiency in the building sector should be in place at national level to ensure consistent savings from circular economy in this sector, which still is the single most relevant for emissions besides energy production.

Improve efficiency in district heating

Building on the efficiency first principle, by 2030 Romanian district heating must be brought up to maximal efficiency. In such a scenario DH should work on renewable energies only, and extensive refurbishment and insulation of the pipes should be carried out.

The main goal of this measure would be getting rid of the 38% thermal leakage that hinders efficiency nowadays and that undermines dwellings refurbishment: in fact citizens are reluctant to undertake such refurbishment not only for economic reasons (lack of information, difficulties to deal with the upfront cost etc) but also because this inefficiency for the upstream system is well known and plays a negative role in motivation.

Promote small scale renewable energy

A scenario of strong penetration of renewable energy in single rural and urban dwelling is achievable by 2030 if programs such as the Green House programme will be further developed.

Indeed the Romanian real estate market is one made of mostly private dwellings with single propriety being the rule. Low-income families are quite a relevant share of the population and these economics shall be taken into consideration in the refurbishment plans in order to attain the best possible results. The most valuable scenario is the one of full implementation of the ongoing successful practices such as the thermal certificate of buildings, the incentives for the First Home, and those for installing solar panels, combined with a series of measures lead by public financing in order to get rid of upfront cost for low-income families. Both direct grants and zero-interest loans have proven to be working policies in other countries that should be applied to Romanian dwellings as well.

Implement low-cost solutions

In rural areas, a combination of ongoing practices and new policies can bring the best results: a vast program for buildings insulation is on its way: it is financed by local authorities with no or minimal contribution from the beneficiaries and this should be complemented by the adoption of building codes that on the one hand favour the use of natural, highly efficient, low-cost materials (thatch for roofs, wooden mainframes instead of steel-enforced concrete, lime instead of polymer paintings, insulating panels made from agricultural waste, etc) and on the other hand promote the adoption of traditional architecture in order to preserve Romanian heritage.

5.3 Suggested scenarios for Italy based on best practices

Adopt small scale renewable energy source installations to contrast energy poverty

Building on the examples of Porto Torres Municipality and Puglia region we expect RES to contribute substantially to the reduction of energy poverty by 2030 by means of implementation of the existing policies related to small RES systems.

The town of Porto Torres and, more recently the region of Puglia, have come up with a complex scheme that will entitle low-income family to make use of RES systems (Photovoltaic panels, Solar thermal collector or micro wind turbines, on a case-by-case scenario) with no upfront cost for the end-users. The system gives families access to self-produced energy while the income of electricity fed back to the grid through the metering system is directed to a revolving fund that will be used to install more systems.

Though the amount of the grant is relatively small (< euro 6M) the value of the project is the one of having a source of income to re-finance the measure and to keep it going regardless of future budget constraints.

Should this best practice be adopted by all Italian regions with a similar yearly budget, the number of existing small RES installation would grow by at least 50% by 2030 as a result of this single measure only. This would add to the existing obligations of installations on all new Near Zero Energy Buildings (NZEB) and public buildings.

Going NZEB in all public buildings

Building on the experience of project such as the one of Genoa's University by 2030 all major public compounds (school clusters, universities, hospitals etc) should be transformed into NZEB and provided with smart mobility. Indeed, the University of Genoa has decided to transform the Savona Campus, which hosts a population of around 2,500 people, into an innovative and sustainable city model thanks to a series of measures co-funded by the Government: deep renovation (cogeneration coupled

with thermal insulation of the buildings) RES installations and e-mobility (4 electric vehicle charging stations have been installed: two traditional and two with "Vehicle to Grid" technology (V2G)).

These actions not only provided a chance to drastically lower bills for the university (therefore generating savings that will pay back in time) but they had a positive effect on local jobs and created momentum for energy efficiency in the community.

5.4 Suggested scenarios for Poland based on best practices

Preventing urban sprawl and ineffective use of energy

Many Polish single houses have been built in the last 30 years in suburban areas that have been developed in post-communist times. These areas enjoyed freedom of spatial planning and were not connected to district heating systems, nor they are likely to be connected in the future: this gave way to an urban sprawl made of cheap, autonomously heated housing, that can now hardly be connected to any energy network or even waterworks.

Nowadays the trend of suburbanisation of Polish cities is continuing, because public authorities seem to lack effective administrative tools to stop it. They also do not have effective tools to monitor and control energy use in private housing. This is a major obstacle to achieving considerable energy savings in this sector by 2030.

This must be tackled by introducing a national plan for urban areas that prevents the urban sprawl, compels new buildings to be connected to DH or to be heated only by RES: by grouping buildings in dense areas, energy consumption for transport and heating will be minimised.

Curbing domestic emissions is achievable

Emissions of GHG in Poland are roughly 40% related to buildings. Of these emissions, only up to 5% are related to buildings managed by public authorities, the rest being related to privately owned buildings such as

homes and offices, that account for roughly 6M dwellings. Only 10% of them are blocks of flats.

Over 5M polish buildings are single houses built with poor insulation and these should be the priority target to go past the goals the NECPs is setting for this sector and to achieve carbon neutrality by 2050.

As more advanced programs dedicated to single-family housing, like “Clean sky” and “Stop smog” have only started within the last 5 years, the amount of dwellings that have been refurbished is still very limited. The large amount of the real estate stock is untouched and still uses very old energy source appliances, such as coal or old wood stoves.

This renovation process must be accelerated by the introduction of much higher investment for the Clean Sky and Stop smog programs and reformulating these programs in order to get rid of upfront cost for citizens.

Alongside these programs for deep renovation a scenario of at least 30% dwellings accessing to some sort of refurbishment and energy efficiency plan can only be obtained by simplified procedures to switch heating and cooling to RES either by direct contributions by the state, or low-interested and state-guaranteed loans, again with the goal of avoiding anticipation of the costs by the citizens.

A third much-needed action is to replicate energy audits as in Poznan, where these free audits lead to massive uptake of the refurbishment market, with hundreds of family investing in energy efficiency after their awareness rose upon the energy audit.

Foster refurbishment of condominiums

In the sector of block of flats, severe energy consumption cuts can be achieved by 2030 and climate neutrality can be reached by 2050. This is possible in light of the given the limited amount of units (10% of private dwellings) and of better building technologies that were adopted for their development. However, these technologies do not necessarily entail a high energy efficiency standard.

This is why, taking advantage of past and existing renovation incentives, roughly 50% of the condominiums have already been renovated at least once since 1990 with additional thermal insulation. Now, within the next 30 years, it will be possible to make another renovation with much higher energy standard dovetailed with the implementation of renewable energy sources such as PV and/or Heat Pumps, both in local and district heating.

The remaining 50% of these buildings, which have never been upgraded, should be renovated for the first time, and it is considered feasible to cut

energy use in those buildings by 80% and install renewable energy sources appliances. Positive trends in the renovation of this part of the building stock are stimulated by accelerated payback times.

Full and swift implementation of the Energy Performance of Buildings Directive (EPBD)

National definition of the Near Zero Energy Buildings is extremely weak (70 kWh/sq.m) if compared with other countries. Considering that there are Polish local authorities which opted for a much more ambitious energy standard, in order to save on significant maintenance costs we call on the government to upgrade the national standards to the level of ambitions of the best performing local ones, and that at least 3% of public buildings are restored every year with such ambitious target, in order not to have a lock-in effect for the public sector that would inevitably fail to achieve carbon neutrality by 2050.

A remarkable experience to build upon is one of the municipalities of Kępice, where new social housing in 2015 were built with nationally-produced high-performance materials and equipped with photovoltaic. These new homes were built at the same cost than the average stock in the market, thus resulting in a net economic gain for both the municipality and the tenants.

5.5 Suggested Scenarios for Spain based on best practices

Cutting costs and emissions in the Public building sector

Conspicuous savings can be obtained by adopting an ambitious policy on refurbishment of real estate that is dedicated to public housing, building on the example of the Navarra region. In this region, the regional government has adopted the Passive House scheme as a compulsory measure for refurbishment in social housing neighbourhoods.

Saving up to 75% on the existing building stock can greatly contribute to peak shaving in summer when cooling needs become a major energetic concern in Spain.

The measure could also provide several other benefits such as increasing the employment rate in the building sector and rural development.

This type of policies also to be favoured when it comes to tackling energy poverty: indeed the Navarra program was targeting primarily low-income families and has achieved remarkable results in this field.

Improving district heating and energy efficiency in condominiums

On private buildings, we estimate that as much as 40% of the energy consumed by household can be cut if a project such as the Fasa Rehabilitation Project 2017 - 2020 which was carried out in the *Delicias* neighbourhood, in Valladolid was deployed in all provinces.

The project is a comprehensive energy rehabilitation of buildings, consisting of renewable energy supply, increased housing comfort and reduced GHG emissions through -among other things- the thermal insulation of facades and roofs, construction of photovoltaic facades, a biomass boiler and installation of energy meters and thermostats.

To scale up the results of that pilot project either revolving funds or E.S.Co (energy service company) can be brought into the scheme, in order to avoid upfront cost for tenants

On top of direct emissions cuts, creation of jobs and decrease of fuel imports, these projects targeting citizens have an important awareness-raising effect, thus enabling broader behavioural change.

➤ 6. Going climate neutral in the Agriculture sector

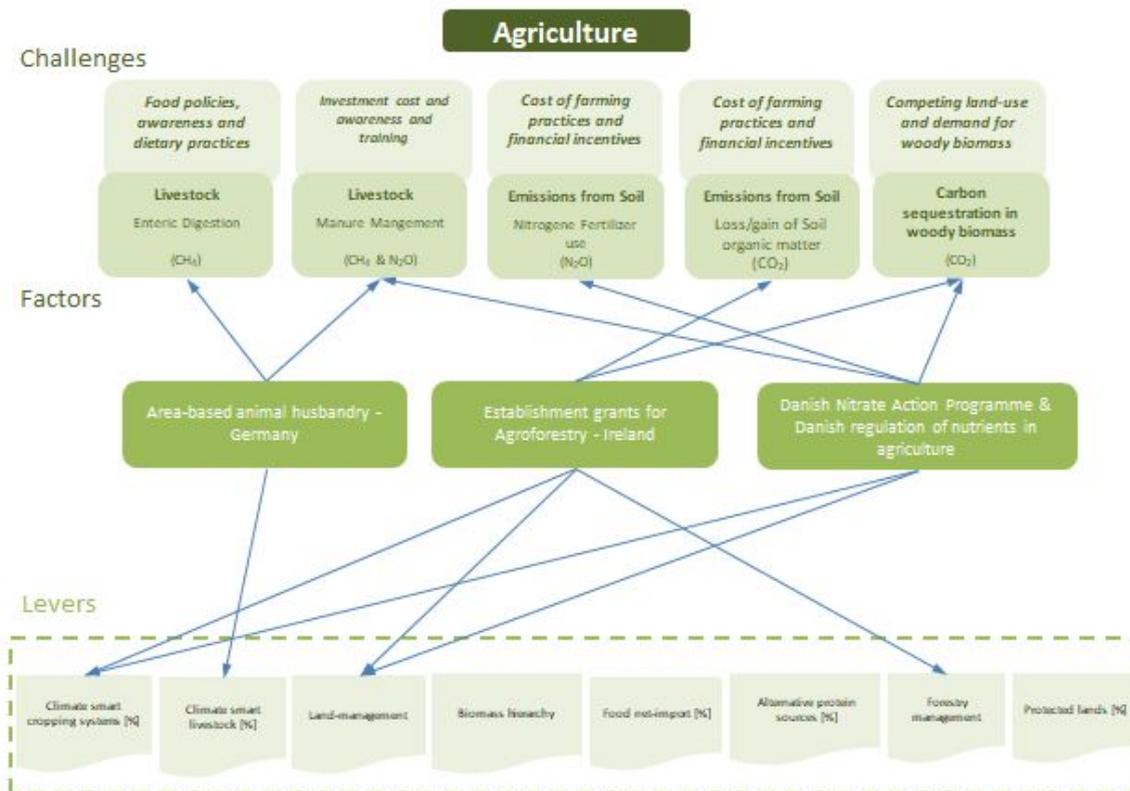
6.1 Suggestions and indications from reference countries

The main drivers of GHG emissions from European agriculture are the large number of livestock (especially ruminants), fertilisation (whether synthetic or organic) and land use.

Livestock composition and numbers are influenced by domestic and international demand for animal products but also by the policy framework (primarily the Common Agricultural Policy, CAP) that favours intensive livestock production for subsidies. Similarly, fertilisation and land use changes are strongly driven by the need to produce animal feed

The amount of carbon sequestered in biomass is influenced by different competing land-use practices and demand for plant biomass or alternative agricultural products as food, raw materials and feedstock or fuel.

The GHG emissions from farming are largely a result of the financial and regulatory framework set in the CAP and the way the CAP is adopted in the Member States. These factors also reflect a number of challenges related to economic, social and legal aspects that drive or inhibit certain actions. The list of challenges below is not exhaustive but exemplary of the bottlenecks or shortcomings that need to be addressed by policy and best practices.



The practice of area-based animal husbandry has been applied in Germany and parts of the Netherlands. In Germany the legal instrument is the Building law. The measure aims at reducing the pressure of livestock production on our environment. The approach is to adjust the maximum number of livestock in a certain area to the land that is available to produce their feed and spread their manure.

Currently, agriculture is defined in the German building code as “... including animal husbandry, as long as the feed can mainly be produced on land belonging to the same agricultural holding”, whereas “mainly” means more than 50% and “can” means the feed does not have to be produced on the land belonging to that farm, nor does the manure have to be spread on that land. If a farmer is theoretically not able to produce 50% of the feed for his or her animals on that farm it is qualified as “industrial livestock farming” (Gewerbliche Tierhaltung).

The agroforestry measure established in Ireland - Establishment grants for Agroforestry - aims to integrate woody perennials like trees and shrubs with crop and livestock production. Climate benefits arise from carbon sequestration in trees, but also a potential increase of soil carbon content. In this grant the focus is set on the latter, combining sheep and cattle grazing or silage production with trees. The grant provides a subsidy per

hectare enrolled. The scheme is accompanied by rules and guidelines ensuring the long-term climate benefits. To avoid negative trade-offs, these grant should only be applied on non-drained mineral soils, to make sure they do not increase mineralization of carbon rich soils. Therefore, this type of measure is compatible with net-zero pathways

6.2 Suggested scenarios for Hungary based on best practices

In Hungary, there is ample room for improvements for the NECPs to adequately address climate change mitigation in the agricultural sector. First and foremost, the government has to recognize the potential that agriculture has in mitigating GHG emissions and the necessity of serious climate change adaptation policies in the sector. As for now, agriculture-related measures are absent in the NECPs. The following sections outline some measures that could be part of a scenario where the Hungarian NECP targets climate action in the agricultural sector.

Horizontal political cooperation

The Government should establish a comprehensive horizontal cooperation among the competent ministries (especially the Ministry of Technology and Innovation responsible for the strategic documents like NECP and the Ministry of Agriculture) and other relevant bodies (like NGOs and researchers), to ensure the relevance and effect of adopted measures. The Government should evaluate which, if any, of the several strategic documents (like the National Rural Strategy 2020, Sustainable Agricultural Structures and Produce Policy, Land and Property Policy, Conservation of Natural Values, Sustainable Natural Resources and Landscape Management Measure etc.) have relevance in planning the agricultural climate change policy. Such evaluation should be based on a thorough evaluation of past and current agriculture-related climate programs.

Focus on research

Further research needs to identify the scope and impacts of the potential agricultural climate change mitigations feasible in local Hungarian contexts and these actions should be prioritized according to effectiveness. This research should be aligned with selected high-quality Hungarian strategy documents, IPCC reports and field data from the sector.

Reform of subsidies to avoid perverse effects

One of the most important actions should be the removal of environmentally harmful direct and indirect subsidies. It is essential that the causes of expected emissions increase be identified, explained and addressed in the NECP. On this basis, implementation tools for the selected actions should be worked out and linked to clear targets and indicators.

6.3 Suggested scenarios for Italy based on best practices

The Italian NECP should focus on concrete targets and indicators leading to actions reducing the agricultural sector's GHG emissions while also enhancing soils' sequestration capacity. Ideally, these actions should also provide co-benefits for biodiversity, landscape and the quality of the products. The following section outlines some measures that could be part of a scenario where the Italian NECP improves climate action in the agricultural sector.

Two examples to promote: local organisation for sustainability

A good practice to emphasise is the Biodistretto del Chianti in Tuscany. This project builds around organic farming, aiming at sustainable management of local resources in the area. The project regulates both production and consumption of products and has the ambition to shape

the landscape and the economy of the area around sustainability, deriving most good practices from organic farming. The model was agreed upon amongst farmers, citizens, the tourist sector, local associations and municipalities and promotes basic sustainable agricultural practices such as crop rotation, permanent grasslands and reductions in nitrogen fertilisers. The biological model focuses on a close collaboration between research and production and has contributed to a third of the agricultural land in the seven participating municipalities.

Another example, also in Tuscany, is in the area of Fucecchio near Florence where nine municipalities and other local actors carried out a project for water and biodiversity co-funded by EU structural funds. The project is promoting 34 interventions on agricultural land, counting practices such as restoration and creation of wetlands, planting of native essence plants, introduction of buffer strips and more. The project is meant to make use of the carbon sinking capacity of the local habitats that are being restored, thus aiming at a greater resilience of the territory. Again this project is one that focuses on agricultural and land use good practices to pivot a more general economic shift towards sustainability, thus achieving results on social and cultural grounds too.

These two projects are inspirational ones for the NECP and if such grassroots projects will be implemented in every Italian region, a clear shift towards climate mitigation in the mainstream agriculture narrative both at national and local level could take place, leading to a more central role of agricultural economics in the society and fully disclosing its potential for climate policies.

6.4 Suggested scenarios for Poland based on best practices

For the Polish NECP to contribute to climate change mitigation in the agricultural sector, much still needs to happen. As agricultural land accounts for almost half of Poland's surface area, there is a lot at stake in the country. Specifically, it should contribute to the promotion of agricultural practices that support the stability of the natural system and it should stimulate and support small-scale farmers to reverse the trend of decreasing farm numbers and increasing farm sizes. The following sections

outline some measures that could be part of a scenario where the Polish NECP targets climate action in the agricultural sector.

Promotion of sustainable practices in policy instruments

There is a need for coordinated and serious political commitment to making Polish agriculture more sustainable. There are already many existing measures suitable for Polish conditions that could enhance the sustainability of the sector. The maintenance of a permanent plant cover reduces soil erosion and sequesters CO₂. The cultivation of leguminous catch crops increases the nitrogen content of the soils and reduces the need for fertiliser application. Proper fertilisation with organic fertilizers, ploughing crop residues or no-tillage improves the condition of soils and allows for permanent storage of organic carbon in them, contributing to climate protection. The introduction of mid-field afforestation and extensive use of meadows contributes to increasing biodiversity and can increase carbon sequestration.

Practices such as these are already encouraged in the greening measures and enhanced conditionality of the current CAP and since the entry to the EU, Poland has put an end to degrading practices such as burning stubble, storing manure directly on the ground or applying fertilizers for frozen soil. However, for the past decades Polish governments have opted for a very limited inclusion of agri-environmental measures in the national agriculture policy. For example, in the current CAP (2014-2020) the share of support for agriculture to such measures was only 8.6% whereas it was ten times more in Austria. These experiences with the CAP indicate the need for coordinated policy effort in Poland. Major policy efforts as the CAP and NECP must be subject to drastically bigger climate ambitions and work in conjunction to guarantee effective mitigation in the sector.

Support for small farmers for a diverse sector

After 25 years of EU's transformation, around a third of the Polish farms have disappeared with large implications for the rural areas. Furthermore, Poland, as the only MS, has decided to shift the entire allowable pool of funds (25%) from the second pillar of the CAP for rural development to

direct payments under pillar one. In consequence, the largest farms obtained the most funds allowing them to modernise their production while small/scale farmers received very little and it also meant a reduction in funds allocated to support agri-environmental programs. Small scale farming indeed tends to be less carbon-intensive.

The preservation of a diverse agriculture with a strong presence of small farms is crucial for the sustainable development of rural areas and for the sustainability of agricultural production. By maintaining agricultural land in good culture and conducting less intensive production than in large farms, they have a positive impact on the state of the environment, maintaining biological and landscape diversity, reduce greenhouse gas emissions and counteract rural depopulation. Therefore, owners of small farms should be encouraged and supported to form cooperatives and producer groups, jointly use agricultural machinery, as well as plan production directions and sign contracts for the sale of agricultural products

If the environmental services required from farms (animal welfare, protection of pollinating insects, soil protection, biodiversity conservation, water protection and reduction of greenhouse gas emissions) should be fulfilled, the NECP together with the CAP needs to support farmers for pro-environmental activities rather than for the current model based on the size of the area.

6.5 Suggested scenarios for Romania based on best practices

Romanian agriculture has the opportunity to address climate change through a diversity of actions, considering both nitrogen and carbon emission and sequestration. The following sections outline some measures that could be part of a scenario where the Romanian NECP targets climate action in the agricultural sector.

Sustainable nitrogen management

Thus, NECP should strongly consider addressing a sustainable nitrogen management, coping with the National Emission Ceilings (NEC) directive provisions on reducing atmospheric nitrogen losses by adopting a Code for Good Agricultural Practices to control the ammonia emissions. The Romanian NECP should envision NH₃ reductions, stimulating farmers (especially intensive animal breeders), farmer organizations and municipalities for appropriate investments. Support should cover investments such as biogas plants and composting facilities. There is a long way for Romanian agriculture to realistically reduce its ammonia emissions by 13% in 2029 compared to 2005 to meet the National Emission Ceilings Directive (NECD) target. However, by having the Code in place, the possibility of financing appropriate investments in machinery and storage facilities for farmers to reduce N losses and to establish the Agricultural Knowledge and Innovation System (AKIS), it may be feasible.

For reducing nitrous oxide emissions, N-use efficiency farming practices should be encouraged, while maintaining a low use of mineral fertilizers may be achieved via nitrogen-fixing cover crops. For this, it is important that AKIS be set-up as fast as possible, at the beginning of the implementation of the NECP. This could stimulate Operational Groups activity towards innovative actions, such as the above-mentioned investments or just simple farming practices that will increase nitrogen use efficiency. Thus, a significant effort to make farmers aware should be made. Farmers will also need to be financially supported for investments, ideally through the second pillar of the CAP (EAFRD).

Sustainable land use and policy alignment with the CAP

Conservation of existing grasslands should be as well a priority in the NECP, just as it is in the CAP. Grasslands play an important role in sustainable nutrient management and they function as important carbon sinks that become net sources of CO₂ emissions under the wrong management. NECP should also encourage no-tillage practices, considering that Romania has large arable areas. More efforts should be made to promote agroforestry systems, especially on areas with risk of soil erosion or prone to drought.

As the main driving force in the modernization agriculture is the EU funds, the NECP should fully consider the next programming period for the

Common Agriculture Policy, aiming at a clear reflection of the climate change issue within the Strategic Plan and identification of the appropriate needs.

6.6 Suggested scenarios for Spain based on best practices

In the scenario of a more ambitious and concrete strategy on climate and agriculture in the Spanish NECP, several existing good practices should be promoted and even required as mandatory. The following sections outline some of those measures that could be of inspiration for the NECP in order to build a scenario where the agricultural sector plays a role in Spanish climate policies as relevant as its potential is.

Promoting the practice of crop rotation

One such practice is crop rotation. Replacing cereal monoculture with 3-5 different crops (cereals, oilseeds, legumes) at the plot level in a temporal sequence has proved a good measure to improve soil fertility and structure. In this way, it is also possible to decrease the use of synthetic fertilizers and the arable system becomes more resilient against climate change and pests. This measure is already included in the European Commission's suggestion for enhanced conditionality in the CAP post 2020 (GAEC 8) so it would be logical to include it in the NECP and in the national allocation plan (NAP).

Promoting the practice of green covers

Another practice to highlight for the Spanish context is the use of green covers and pruning residues for soil improvement. Green cover is understood as any vegetation covering the agricultural plot between cropping during critical periods (usually autumn and winter) for avoiding soil erosion and nutrient leaching. Pruning residues must be chopped and left on the ground as cover. It must be spread on the soil surface without using tillage, leaving the residues to slowly decompose protecting the soil in the long term. Incorporating pruning residues into the soil in permanent

crops improve soil fertility and protect soil against water erosion. Also, it improves the waste cycle. This measure also figures in the proposed enhanced conditionality (GAEC 7) of the future CAP and could also be implemented as an Ecoscheme.

Shifting from intensive to extensive agriculture

In general terms, promoting traditional extensive agriculture at the national level and in the CAP is advised. Both for the co-benefits in terms of quality jobs and because it is considered an agricultural system which is less CO₂ intense relative to intensive practices. Extensive agriculture increases CO₂ sequestration and reduces the risk of wildfires, both having a net positive impact on GHG emissions.

7. Relevant legislation

Member States' obligations regarding the NECPs are established by the Governance of the Energy Union and Climate Action Regulation. This regulation sets the frequency, the level of details and the topics to be reported each time, but does not establish the level of ambition, or the specific sectoral measures that countries need for decarbonisation of their economies.

The European Commission has commented and will nonetheless evaluate the NECPs and check whether, collectively, the plans achieve the EU goals in terms of emissions reductions, energy efficiency and renewable energy share - these last two especially because there are no national targets but rather one target for the Union as a whole.

National organisations willing to engage in the NECP process can (and should) analyse the strength of the plans and part of the assessment should focus on compliance with the EU regulations of the sectors. The EU has set the overall 2030 targets on renewables, GHG emissions reductions and energy efficiency improvements as well as a series of pieces of legislation applicable to the sectors that will contribute to these overall targets.

The PlanUp project has developed a “beginners guide” for climate and sectoral decarbonisation policies⁷ for the 2020 and 2030 framework. For the context of the NECPs, the 2030 framework is more relevant.

General	Transport	Agriculture	Buildings
EU Renewable Energy Directive (REDII) - 32% target	CO2 standards for light and heavy-duty vehicles	Common Agricultural Policy (CAP)	Energy Performance of buildings Directive (EPBD)
Energy Efficiency Directive (EED) - 32.5 % target	Clean Vehicles Directive	Nitrate Directive	Eco-design and eco-labelling
43% GHG emissions reductions: - EU ETS - EU ESR	REDII (transport part)		

Besides these EU requirements, there are national policies and measures that are not required by the EU but the countries can improve the uptake of renewables, reduce GHG emissions and improve efficiency by working on the sectors. In the guide on climate policy (see footnote 4) developed by the PlanUp project there are detailed descriptions of these national measures (which include taxation for fuels, for instance).

8. Relevant resources and contacts

The organisations working on the PlanUp project have experience working on the different policy sectors discussed along this project. This includes climate governance, agriculture, energy efficiency, buildings, transport policy, etc. Find hereunder links to relevant papers from each organisation and of the project, as well as a list of key contacts within the team on each area of expertise.

Name	Organisation	Area	of	E-mail
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⁷ [Guide on EU Climate & Sectoral decarbonisation policies](#). January 2019.

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Hereunder we set out a (non-exhaustive) list of resources that can be of interest for providing input to the NECP process, as well as any other climate policy discussion. Please keep an eye to the PlanUp Project website for updates and useful information, as it is updated regularly, as well as on the partners' websites - outlined above.

- PlanUp project website: <https://www.planup.eu/en/countries>
- PlanUp project resources corner: <https://www.planup.eu/en/resources>
- Fit so succeed? An assessment of the draft NECPs:

- Italy:
<https://cdn.webdoos.io/planup/5ef69ef1836e05c44df7ebd95596c768.pdf>
- Spain:
<https://cdn.webdoos.io/planup/9a2deeedec3577c7c5a94f280bf4af90.pdf>
- Romania:
<https://cdn.webdoos.io/planup/ce30d99e5bfba79c4c7b9f8194ffb5c5.pdf>
- Poland:
<https://cdn.webdoos.io/planup/7167cf1e2b5d89120a08cac04136980f.pdf>
- Hungary:
<https://cdn.webdoos.io/planup/9dc4be3ef36b160348f3d24e017ebced.pdf>
- Guide on EU Climate & Sectorial decarbonisation policies:
<https://cdn.webdoos.io/planup/6189524acb1e9fc640a5cb5f7366f7f9.pdf>
- Good practice in Climate & Energy Governance:
<https://cdn.webdoos.io/planup/cd0d0ec7c01416b6e1cc94f650c611b9.pdf>
- Main findings in good practice governance:
<https://cdn.webdoos.io/planup/8796e0620db7f235c0b4213b5f466bd7.pdf>