

Overview of Low-Carbon Development Strategies in European Countries

Information reported by Member States under the European Union
Monitoring Mechanism Regulation

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Key messages

- The 2011 Cancun Agreements under the UNFCCC required developed countries to develop low-carbon development strategies (LCDS) or plans. Accordingly, Member States had to report information on those strategies to the EU in 2015.
- In 2015, all 28 Member States submitted information on the preparation or the status of their LCDS. 20 Member States have submitted updates since then.
- However, the key elements of these LCDS were not further established and formally agreed, either at EU or at international levels.
- Consequently, EU Member States developed and presented as national LCDS a large variety of plans, strategies or documents, which differed one from another by their nature, status, size, timeframe, elaboration process, etc.
- 13 Member States are considered to have developed a proper LCDS, 10 of which have been legally adopted. This assessment is based on a screening done by the EEA and its ETC/ACM, using criteria such as public availability, the definition of objective(s) for 2050, or the description of pathways, actions or policies.
- The strategies reported by Member States fail to systematically address important elements such as: clearly defined targets or objectives, coverage of sectors other than energy, key policies and measures to achieve the strategy's objectives, political commitments, information on financing aspects, impact assessment, cost and benefit analysis, and details on progress monitoring.
- Member States must now prepare or update their long-term strategies under the UNFCCC, the Paris Agreement and the EU Regulation on the Governance of the Energy Union and Climate Action. The latter clarifies key features to be covered by those strategies, in particular their necessary consistency with integrated national energy and climate plans covering ten-year periods starting from 2021 to 2030.
- On 28 November 2018, the Commission will publish a Strategy for long-term EU greenhouse gas emissions reductions. It is expected to stir public debate and serve as an input to the Member States' own long-term low emission strategies in preparation.

1 Introduction

1.1 About this Report

This report presents an overview of the information on low-carbon development strategies (LCDS) reported by the EU Member States between January 2015 and April 2018. This report is based solely on the information submitted to the European Commission under the EU Monitoring Mechanism Regulation (MMR) (¹, ²). The report explores in particular the extent to which EU Member States have developed and implemented long-term development strategies with a clear 2050 objective. At the end of the report, summaries per country of all information reported on the national LCDS are presented.

The European Topic Centre for Air Pollution and Climate Change Mitigation (ETC/ACM) carried out the study for the European Environment Agency (EEA).

1.2 Low Carbon Development Strategies in Legislation

International - United Nations Framework Convention on Climate Change

In the context of the United Nations Framework Convention on Climate Change (UNFCCC), both the Copenhagen Accord (2009) and the Cancun Agreements (2010) refer to low-carbon and emission development:

“[...] bearing in mind that social and economic development and poverty eradication are the first and overriding priorities of developing countries and that a low-emission development strategy is indispensable to sustainable development.” (Decision 2/CP.15, Para 2)

“Realizes that addressing climate change requires a paradigm shift towards building a low-carbon society that offers substantial opportunities and ensures continued high growth and sustainable development, based on innovative technologies and more sustainable production and consumption and lifestyles, while ensuring a just transition of the workforce that creates decent work and quality jobs;” (Decision 1/CP.16, Para 10)

Furthermore, the Durban Agreement in 2011 “[...] invites developed country Parties to submit information related to progress towards the formulation of their low-emission development strategies [...]” (Decision 2/CP.17)

In Doha (2012), the UNFCCC secretariat is requested “[...] to organize regional technical workshops and to prepare technical material to build capacity in the preparation, submission and implementation of nationally appropriate mitigation actions as well as in the formulation of low emission development strategies;” (Decision 1/CP.18)

Most recently, Article 4, paragraph 19 of the Paris Agreement³ explicitly calls on all Parties to develop their long-term low greenhouse gas emission development strategies:

“All Parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies, mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.”

The Conference of the Parties (COP), by its decision 1/CP 21, paragraph 35:

“invites Parties to communicate, by 2020, to the secretariat mid-century, long-term low greenhouse gas emission development strategies in accordance with Article 4, paragraph 19, of the Agreement.”

¹ Regulation (EU) No 525/2013

² Overview of reported information: http://cdr.eionet.europa.eu/recent_etc?RA_ID=700&mindate=2015-01-01

³ Paris Agreement:

https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english.pdf

To date, no definition of low-carbon development strategies has been established and formally agreed. In the context of the UNFCCC process, low-carbon development strategies are also referred to as: long-term low greenhouse gas emission development strategies, low-emission development strategies (LEDS), as well as low-carbon growth plans (LCGP). In different international political fora, the terms are seemingly used as interchangeable. In the scientific literature the terms are generally used to describe forward-looking national economic development plans or strategies, that focus on low-emission and/or climate-resilient economic growth.

European Union

The EU Monitoring Mechanism Regulation (EU 525/2013) sets the requirement to report on low-carbon development. Article 4 required MS to report by January 2015 on the status of implementation of their low-carbon development strategies prepared in the context of the UNFCCC. Article 13 (b) requires MS to report biennially any updates relevant to their low-carbon development strategies.

On 20 June the European Commission, the European Parliament, and the Council reached a political agreement on the governance of the Energy Union. The agreed Energy Union Governance Regulation is supposed to ensure that the objectives of the Energy Union, especially the EU's 2030 energy and climate targets – reduction of 40 % of greenhouse gas emissions, a minimum of 32 % renewables in the EU energy mix and the 32.5 % goal of energy efficiency savings – are achieved. In the absence of legally binding national targets, it obliges Member States to produce by the end of this year draft climate and energy plans for the decade to 2030, and long-term strategies to 2050 to meet the objectives of the Paris Agreement to follow by the end of 2019.

In the Regulation of the European Parliament and of the Council on the Governance of the Energy Union and Climate Action⁴, Article 15 requires all EU MS to submit long-term strategies (LTS) with at least 30 years perspective by 1 January 2020, and subsequently by 1 January 2029 and every 10 years thereafter. If necessary, LTS should be updated every 5 years. MS shall ensure that the Integrated National Energy and Climate Plans (NECPs) for 2030 are consistent with the long-term strategies (Article 15(6) and Recital (36)). MS' LTS shall cover:

- a) total greenhouse gas emissions reductions and enhancements of removals by sinks;
- b) emissions reductions and enhancement of removals in individual sectors including among others electricity, industry, transport, the heating and cooling and buildings sector (residential and tertiary), agriculture, waste and land use, land-use change and forestry (LULUCF);
- c) expected progress on transition to a low greenhouse gas emission economy including greenhouse gas intensity, CO₂ intensity of gross domestic product, related estimates of long-term investments and strategies for related research, development and innovation;
- d) to the extent feasible, expected socio-economic effect of the decarbonisation measures including inter alia aspects related to macro-economic and social development, health risks and benefits and environmental protection;
- e) links to other national long-term objectives, planning and other policies and measures and investments

Furthermore, the Proposal for the Energy Union and Climate Action Governance specifies elements that MS' LTS should contain, such as: overview and process for development of the strategies; content (including total GHG emissions reductions, renewable energy, energy efficiency, sector specific related content); financing and impact assessment of the socio-economic aspects. Annex I presents these elements.

⁴ Proposal for a Regulation of the European Parliament and of the Council on the Governance of the Energy Union and Climate Action: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:PE_55_2018_INIT&from=EN (accessed 23 November 2018). It is expected to be published in the Official Journal of the Union and enter into force in December 2018.

1.3 The European Union Long-Term Strategy

The European Union low-carbon economy roadmap

The European Commission published in 2011 ‘A roadmap for moving to a competitive low carbon economy in 2050’ (EC, 2011), which suggested that:

- by 2050, the EU should cut domestic greenhouse gas emissions to 80 % below 1990 levels;
- milestones to achieve this are 40 % emissions cuts by 2030 and 60 % by 2040;
- all sectors need to contribute;
- the low-carbon transition is feasible and affordable.

The roadmap suggested that, by 2050, the EU should cut its domestic emissions to 80 % below 1990 levels through domestic EU reductions alone. This is in line with EU leaders' commitment to reducing emissions by 80-95 % by 2050 in the context of similar reductions to be taken by developed countries as a group.

The roadmap set out a cost-efficient pathway to reach an 80 % emissions reduction by 2050. To get there, Europe's emissions should be 40 % below 1990 levels by 2030 (this target was already endorsed as part of the 2030 Climate and Energy Policy Framework) and 60 % by 2040.

Action in all main sectors responsible for Europe's emissions – power generation, industry, transport, buildings, construction and agriculture – would be needed, but there are differences regarding the amount of reductions that can be expected between sectors. The power sector was identified having the biggest potential for cutting emissions. According to the Roadmap it can almost totally eliminate CO₂ emissions by 2050. The agriculture sector was identified having the lowest potential but reductions are feasible in the next two decades.

The ranges of reductions implied in each sector in 2050 and the pathways towards an 80 % reduction by 2050 are presented in Figure 1.

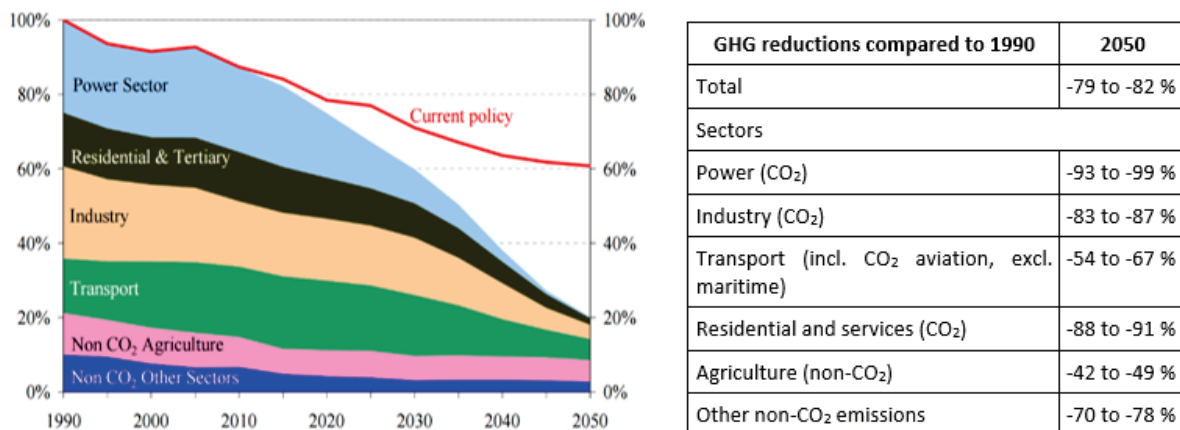


Figure 1: The EU GHG emissions towards an 80 % domestic reduction (100 %=1990) (left), Sectoral reductions of GHG emissions (right), Source: (EC, 2011)

EU long-term strategy

On 28 November 2018, the European Commission will publish a Strategy for long-term EU greenhouse gas emissions reductions. This strategy will include an analysis covering various scenarios for the EU's contribution towards the objectives set out in the Paris Agreement. It will include, inter alia, a scenario on achieving net zero greenhouse gas emissions within the Union by 2050 and negative emissions thereafter. It will also analyse the implications of the scenarios on the remaining global and Union carbon budget in order to inform a discussion about cost efficiency, effectiveness and fairness of greenhouse gas emissions reductions. This strategy should serve as an input to public debates across the

EU, while Member States prepare and submit their own LTS in order to fulfil their commitments under the UNFCCC and the Paris Agreement.

1.4 Approach

The EU MMR (525/2013) sets the requirement to report on LCDS. Article 4 required MS to report by January 2015 on the status of implementation of their low-carbon development strategies prepared in the context of the UNFCCC. Article 13(b) requires MS to report biennially (starting with 15 March 2015) any updates relevant to their low-carbon development strategies and progress in implementing those strategies. Implementing Regulation (EU) No 749/2014⁵ further specifies elements to be included when LCDS are reported and requires MS to report qualitative information regarding the links between reported climate change mitigation policies and measures (PaMs) and LCDS. In order to facilitate the reporting the European Commission developed two templates⁶. The information on objective, description, legal status, status of implementation, the timeline and a description of the progress for the implementation of LCDS and of its update, link to the actual document, provided via these templates is the basis of this report. The submissions received between January 2015 and April 2018 have been analysed.

There is no officially agreed definition of a LCDS and the reporting requirement under the EU MMR for LCDS allows a broad scope in terms of designing and reporting the strategies. Therefore, reported information differs greatly across MS in terms of type of documents, timeframe, level of details, approach, ambition level, sectors cover and status of legal implementation. The assessment was carried out in two steps:

1. The collection and screening of the submissions and referenced documents. Since there is no officially accepted definition of a LCDS the working criteria, to qualify a strategy as a LCDS, were developed:
 - **single document** reported as a strategy and publicly available;
 - the timeframe is until **2050** (or longer);
 - defined **2050 objective**;
 - description of **pathways**, actions, policies or similar;
 - information on **status** of implementation.
2. The documents that were qualified as LCDS were analysed by exploring:
 - **Timeliness**: Has a submission been provided by 9th January 2015? Have updates been provided since then?
 - **Completeness**: Does the submission include the template with all the elements and a (link to) report?
 - **Transparency**: Does the report describe sufficiently clear the target, the key actions, implementation and monitoring activities? Is other general information on the submission provided, i.e. reporting date, last update, legal status, accessibility of reports, language, time frame, etc.
 - **Comparability**: Is the ambition level comparable to that of the EU? Checking the content and coverage of reports, target description, sectors covered, monitoring of progress, status of implementation, institutional arrangements, etc.
 - **Consistency** with the reporting obligation for policies and measures under Art. 13 EU MMR as well as projections submitted under Art. 14 EU MMR.
 - **Robustness**: Does the overall concept seem to be consistent and be suitable to provide for a low carbon development, i.e. transition of economy and society?

⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0749&from=EN>

⁶ Available at: <http://cdr.eionet.europa.eu/help/mmr>

- **Feasibility:** Are legal provisions set to implement the low carbon development strategy?

The type of study, the length, the scope, the level of detail varies widely across MS. Often additional information is available in national languages. To the extent possible, such information was taken into consideration, but the assessment is not exhaustive and is solely based on the information officially reported. MS are encouraged to regularly report on updates regarding their LCDS⁷.

⁷ LCDS submissions should be uploaded to the folder: <http://rod.eionet.europa.eu/obligations/700/deliveries>

2 Results

2.1 Status of Reporting

According to the EU MMR, Member States were required to report relevant information on LCDS in 2015 for the first time and updates in 2017. Table 1 illustrates what kind of information and when was reported.

Table 1: MS submission received in 2015, 2016, 2017 and 2018

Member State	2015	2016	2017	2018
Austria	R		R	
Belgium	T,R		T,R	
Bulgaria	T,R	T	T	
Croatia	T		X	
Cyprus	T,R	X	X	X
Czech Republic	T,R		T,T, R	
Denmark	T,R	X	T	
Estonia	T		T,R	T, R
Finland	T,R		T,R	
France	T,R	R	T,R	
Germany	T,R		T,R	
Greece	T,R			
Hungary	T		T	
Ireland	T		T,R	
Italy	T,R			
Latvia	T			
Lithuania	T,R		T	
Luxembourg	T			
Malta	T,R			
Netherlands	T,R		T	
Poland	T			
Portugal	T,R			
Romania	T,R	X	T	
Slovakia	T,R		X	
Slovenia	T,R			
Spain	T,R		X	
Sweden	X		X	
United Kingdom	T,R		T,R	T,R

Note: T = template submitted

R = report available (reported or provided url)

x = information on LCDS provided in a separate note or as part of the projections/PaMs report

All 28 MS submitted information on their LCDS in 2015. The provided template was used by 26 MS, Austria and Sweden submitted information in individual formats. Twenty MS either provided reports directly in the EEA Central Data Repository (CDR) or as links provided in their template.

In 2016, 5 MS (Bulgaria, Cyprus, Denmark, France, and Romania) submitted LCDS relevant information. Bulgaria submitted the template for reporting on updates, and provided information on measures.

France submitted their LCDS report. Cyprus and Romania informed that no updates occurred since the submission in 2015.

In 2017, 20 MS provided LCDS relevant information, some of MS only provided templates or short update information in the GHG projections or policies and measures reports. However, in nine cases the reports have been submitted. The Czech Republic reported two times, due to governmental approval of the strategy, considered as an important update. For further information, see Chapter 2.4.

In 2018, three MS (Cyprus, Estonia, and United Kingdom) provided updates. The United Kingdom informed about their new Clean Growth Strategy. Estonia reported on the adoption of their LCDS, and Cyprus reported that no updates to their 2015 submission occurred.

Eight MS (Greece, Italy, Latvia, Luxembourg, Malta, Poland, Portugal and Slovenia) provided information only in 2015, and no updated information since then.

2.2 Improvements since First Reporting

All information reported to the EEA Central Data Repository between January 2015 and April 2018 has been analysed. It was checked whether there were actual updates/ improvements since the first reporting in 2015. Figure 2 summarizes the status of the submitted information on LCDS. Seven MS submitted already in 2015 a LCDS, and since then further steps in implementation have been made, but only minor or none changes to the strategy itself. Six MS made a considerable improvement since 2015 such as finalization of a LCDS that was under preparation or legal adoption. Fifteen MS still do not have a strategy that according to the EEA/ETC criteria (described in section 1.4, in particular by the list under no. 1) could be qualified as a LCDS. Within this category, there are MS that are more advanced than others in development of their LCDS. More information about national LCDS is presented in the next sections.

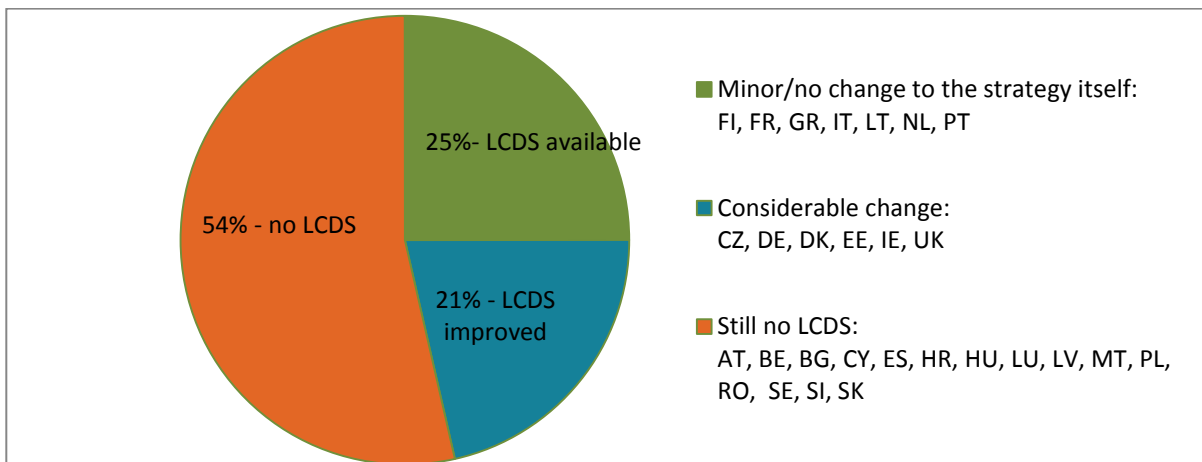


Figure 2: Status of submitted LCDS

2.3 Submissions not considered as Low Carbon Development Strategies

Fifteen MS submitted information and/or reports, which have not been considered as LCDS for the reasons summarized in Table 2. Six MS informed that their LCDS is under preparation, six have a time frame until 2020, and for three MS other reasons have been identified.

Table 2: List of Member States providing information not considered as LCDS

Member State	Reasoning
Austria	In the latest submission Austria provided a Green Book for an integrated Energy and Climate Strategy, which summarises the current situation with a focus towards 2030 and an outlook to 2050. As a clear 2050 objective, pathways and information on implementation is missing it is not considered a LCDS.
Belgium	Belgium is currently establishing a LCDS on federal level. The project 'Belgium's transition to a low carbon society by 2050' is a website presenting a scenario tool, but concrete plans up to 2050 are still missing.
Bulgaria	The timeframe of the Third National Action Plan on Climate Change is only until 2020.
Croatia	The LCDS of Croatia is under preparation.
Cyprus	Cyprus prepared a short draft of the LCDS to 2050, but it does not contain a concrete 2050 objective, nor description of pathways, nor information on implementation.
Hungary	The national climate change strategy of Hungary has a timeframe until 2025.
Luxembourg	The LCDS of Luxembourg is under preparation.
Latvia	The LCDS of Latvia is under preparation.
Malta	Malta's report on the status of implementation of low carbon development policies and strategies does not go beyond 2020.
Poland	The LCDS of Poland is under preparation.
Romania	The national strategy of Romania has a timeframe until 2020.
Sweden	The LCDS of Sweden is under preparation.
Slovakia	The LCDS of Slovakia is under preparation.
Slovenia	The program submitted by Slovenia has a timeframe until 2020.
Spain	The Spanish Strategy for Climate Change and Clean Energy has a timeframe until 2020.

2.4 Overview of National Low Carbon Development Strategies

According to the identified criteria for the purpose of this analysis (described in section 1.4) 13 MS submitted documents qualifying as LCDS and these are further analysed. Table 3 gives an overview of the available LCDS, their type, legal status, publishing year or reduction targets.

Legal status

Regarding the legal status, ten MS report plans or accompanying actions as legally adopted. As the nature of LCDS varies across MS, also the legal adoption is diverse: adoption of implementing actions, adoption of strategy itself, or commitment to target in government programs. Denmark, Greece and Portugal reported their LCDS as not adopted.

Publishing year

The publishing year varies among MS. Some documents have been prepared in recent years, maybe triggered by the reporting requirement on LCDS. Other MS already started the development much earlier, which may indicate that the country is more sensitive and aware of the need for action and long-term planning.

Table 3: Overview of LCDS status and submitted reports

MS	Title of report	Type of LCDS	Legal status	Publishing Year	Time-frame	Emission reduction targets (%)
CZ	Climate Protection Policy of the Czech Republic	Strategy	adopted	2017	2050	80
DE	Klimaschutzplan 2050	Action Plan	adopted	2016	2050	80-95
DK	Government Platform 2016	Strategy	not adopted	2016	2050	80-95
EE	General Principles of Climate Policy until 2050	Roadmap	adopted	2017	2050	80
FI	Energy and Climate Roadmap 2050	Roadmap	adopted	2014	2050	80-95
FR	Stratégie nationale bas carbone	Strategy	adopted	2015	2050	75
GR	National Energy Planning Roadmap for 2050	Scenario Analysis	not adopted	2012	2050	60-70
IE	National Mitigation Plan	Action Plan	adopted	2017	2050	80
IT	Strategia Energetica Nazionale	Strategy	adopted	2013	2050	80-95
LT	National Strategy for climate change management policy	Strategy	adopted	2012	2050	80
NL	Klimaatbrief 2050	Strategy	adopted	2011	2050	80
PT	Roteiro Nacional de Baixo Carbono 2050	Roadmap	not adopted	2012	2050	50-60
UK	The Clean Growth Strategy	Strategy	not adopted	2017	2050	80

Type of Low Carbon Development Strategy

Based on the wording used by the MS, the types of LCDS are understood as follows:

- A ‘Strategy’ clearly describes the long-term vision, including objectives and goals. It serves as a guidance for policy makers and gives directions for further action.
- A ‘Roadmap’ is similar to a strategy but more concrete, i.e. containing sectoral pathways.
- An ‘Action Plan’ is seen as a document containing concrete measures on various levels.
- A ‘Scenario Analysis’ describes various developments based on different assumptions and objectives.

The nature and the approach for elaboration of the national low carbon development strategies varies widely and so the binding character for implementation. The submitted documents (including the ones not considered as LCDS) often contain links to additional studies, which have character of feasibility studies, scenario analysis, Green Paper starting a discussion, policy making guides (analysing ways and means), development strategy/vision, analysis of reduction potential, introduction of concrete action (e.g. carbon budgets). Feasibility studies, scenario analysis or similar, appear as bases to develop a long-term vision, which can then be also approved by political stakeholders, and legally adopted. A commitment from decision makers and embedding of low-carbon development strategies in legislation is seen as crucial to achieve 2050 targets.

Objectives and targets

The EU has committed to reduce its GHG emissions by 80-95 % by 2050. This objective has been transposed by many MS in their national low carbon development strategies. The ambition level varies among MS. Some limit their national reduction by 2050 to 80 % or less. Table 4 presents the national 2050 targets to reduce GHG emissions and the qualitative objective, if provided by MS. The differences in the terminology for qualitative national targets are often unclear.

Table 4: National 2050 targets

MS	National reduction in % by 2050	Qualitative national target
Belgium*	80-95	low carbon development
Czech Republic	80	low emission development
Denmark	80-95	low-emission society independent of fossil fuels by 2050
Estonia	80	competitive economy with low carbon dioxide emissions in 2050
Finland	80-95	carbon-neutral society
France	75	green growth
Germany	80-95	extensive greenhouse gas neutrality by mid-century
Greece	60-70	energy sector
Ireland	80	low carbon, climate resilient and environmentally sustainable economy by 2050
Italy	80-95	decarbonisation of the economy
Lithuania	80	NA
Netherlands	80	climate neutral economy by 2050
Portugal	60	low carbon economy by 2050
Sweden*	80-95	zero net emissions in 2050
United Kingdom	80	decarbonising all sectors

Note: *Belgium and Sweden are included in this list, although the LCDS is still under preparation, but in the documents provided the target was already clearly described.

Three MS (Austria, Lithuania and the Netherlands) mentioned explicitly that the further development or update of the LCDS will be linked to the future reporting under the Energy Governance regulation.

More details about the strategies can be found in Chapter 4 in country fiches.

Scope of the Long Carbon Development Strategies

The scope of the strategies differs greatly across MS. Table 5 summarizes the scope of the 13 strategies qualified, based on the EEA criteria, as long-term strategies. More than half of them (Czech Republic, Germany, Estonia, France, Ireland, Lithuania, Portugal, United Kingdom) address all main sectors however five MS (Denmark, Finland, Greece, Italy, the Netherlands) focus on the energy sector. Six MS (Czech Republic, Finland, France, Germany, Ireland, United Kingdom) identified key long-term actions and three MS (Denmark, Greece, the Netherlands) give some general information on possible measures to achieve the national objectives. The energy measures: increased use of renewable energy, and increase in energy efficiency are the key measures for all MS to achieve reductions in GHG emissions. Ten MS (Finland, France, Germany, Greece, Italy, Ireland, Netherlands, Lithuania and Portugal, United Kingdom) also identified carbon capture (use) and storage as an important technology to achieve the 2050 objectives. Nuclear technology was mentioned by four MS (Czech Republic, Italy, Lithuania and the United Kingdom) to achieve decarbonisation in the energy sector. The sectors least targeted by policies and measures are agriculture and waste.

Table 5: Scope of the national strategies

Country	Main sectors covered	Key policies	Renewable energy	Energy efficiency	Carbon capture (use) and storage	Nuclear energy	Finance aspects
Czech Republic	yes	yes	yes	yes		yes	yes
Denmark	mostly energy	yes, general	yes	yes			
Estonia	yes	no	yes	yes			
Finland	mostly energy	yes	yes	yes	yes		
France	yes	yes	yes	yes	yes		yes
Germany	yes	yes	yes	yes	yes		yes
Greece	only energy	yes, general	yes	yes	yes		
Ireland	yes	yes	yes	yes	yes		
Italy	mostly energy	no	yes	yes	yes	yes	
Lithuania	yes	no	yes	yes	yes	yes	yes
Netherlands	mostly energy	yes, general	yes	yes	yes		
Portugal	yes	no	yes	yes	yes		
United Kingdom	yes	yes	yes	yes	yes	yes	yes

The main policy areas are the following:

Energy production

- Fuel switching from coal/oil to gas;
- Increased use of renewable energy sources;
- Energy grids, decentralised energy production units;

Energy consumption

- Energy efficiency in households, business and industries;
- Smart energy use;
- Renovation of buildings;

Transport

- Electromobility;
- Transport management (public transport, modal shift);
- Increased use of biogas and biofuels;

Crosscutting

- Increased use of carbon sinks;
- Circular economy;
- Research for innovative technologies;
- Education, awareness raising.

Most countries do not address finance aspects of transition to the low carbon economy. When provided, the type of financial information is not consistent across Member States. Some report on funds, others on investments or expenditures or economic effects. The same applies for monitoring of progress and implementation, except for the MS having introduced carbon budgets, or a monitoring system for

implementation actions like in Bulgaria. Five of the Member States (Estonia, France, Germany, Lithuania, United Kingdom) with a 2050 view also set interim targets, which increase the reliability and allow for progress checking.

Low carbon development strategies can be part of bigger national frameworks together with strategies or plans for climate change adaptation (Czech Republic, Finland, France, Germany, Ireland, Lithuania, Netherlands, and Portugal). Some countries also address explicitly climate change adaptation in their LCDS (Finland, Lithuania, and Netherlands).

2.5 Emission Trends and Outlook to 2050

The 28 Member States of the EU have reduced their emissions by more than 22 % below 1990 levels⁸. Between 1990 and 2015 the EU collectively reduced GHG emissions on average 53 Mt CO₂eq/year. According to the latest GHG projections reported by Member States the future GHG emission reductions between 2015 and 2035 are projected to on average 37 Mt CO₂eq/year. In order to achieve the minimum of the EU 2011 Roadmap (-80 % reductions in comparison to the 1990 level) further substantial decrease is necessary. The time span for achieving this is small, compared to the reduction achieved in the past (Figure 3). The political agreement on the Governance Regulation includes a new long-term ambition, namely climate neutrality as early as possible. To achieve this, MS shall increase their ambition in further reducing GHG emissions.

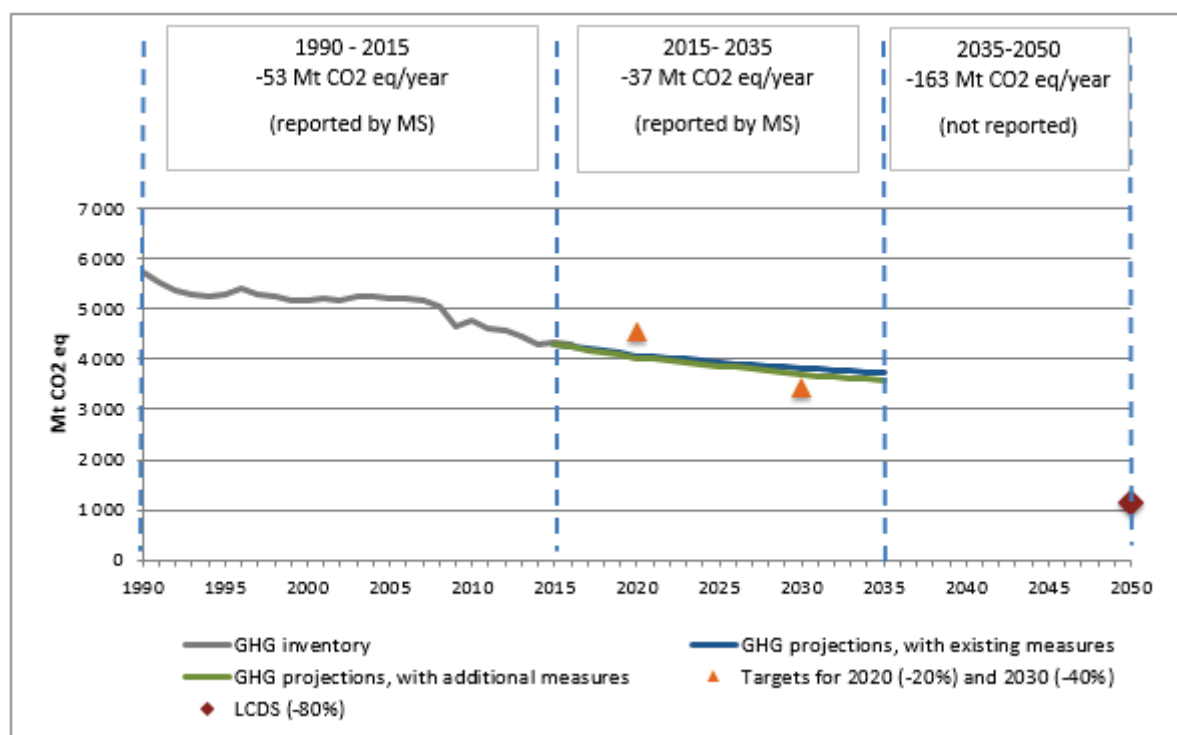


Figure 3: The EU-28 GHG emission reductions and outlook

EU as a whole and majority of Member States project a decrease in their total GHG emissions, however, the speed differs per Member State (Table 6).

Assuming that the 13 Member States which have a clear 2050 objective meet their national minimum target^[1] (Table 4) and other MS stay constant^[1] at their projected 2035 level, GHG emissions will be

⁸ EEA, 2018, 'Data viewer on greenhouse gas emissions and removals, based on the EU's submission to the UNFCCC: <http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>

^[1] National minimum target is to be understood that Member States giving a percentage range of a reduction target, the minimum level is used for the calculation.

reduced by about 3 600 Mt CO₂eq compared to their national 1990 total GHG emissions (excl. LULUCF). For the EU-28, this would translate into a reduction of about 63 % compared to 1990 EU emission levels. The four Member States with the highest share in EU GHG emissions (Germany, United Kingdom, France and Italy) have adopted long-term strategies with reduction targets ranging from -75 % to 95 % by 2050.

Table 6: Achieved and projected GHG emission changes per Member State

	Achieved GHG changes 1990-2015 (Mt CO ₂ eq/year)	Projected GHG changes 2015-2035 (Mt CO ₂ eq/year)	Estimated changes for LCDS goal* 2035-2050 (Mt CO ₂ eq/year)
EU-28 (aggregated)	-53	-37	-163
Member States			
Austria	0.002	-0.58	
Belgium	-1.15	-0.27	
Bulgaria	-1.69	-0.33	
Croatia	-0.31	-0.28	
Cyprus	0.11	-0.03	
Czech Republic	-2.80	-1.40	-4
Denmark	-0.88	0.04	-2
Estonia	-0.89	-0.19	
Finland	-0.63	-0.66	-2
France	-3.60	-3.33	-17
Germany	-13.96	-15.48	-23
Greece	-0.29	-0.61	
Hungary	-1.31	-0.12	
Ireland	0.15	0.17	-4
Italy	-3.48	-2.45	-19
Latvia	-0.59	0.03	
Lithuania	-1.12	-0.10	-1
Luxembourg	-0.10	-0.11	
Malta	-0.01	-0.02	
Netherlands	-1.05	-2.03	-7
Poland	-3.28	-1.35	
Portugal	0.37	-1.09	-1
Romania	-5.19	0.48	
Slovenia	-0.07	-0.08	
Slovakia	-1.33	-0.13	
Spain	1.91	0.31	
Sweden	-0.72	-0.51	
United Kingdom	-11.60	-6.86	-14

Note: * Estimated only for Member States that according to the EEA/ETC criteria have a long-term strategy (highlighted in green).

Table 6 shows that in five Member States (Austria, Cyprus, Ireland, Portugal and Spain) emission levels increased between 1990 and 2015. Germany and United Kingdom decreased emissions the most in absolute terms. The projected change between 2015 and 2035 shows emission increases for five MS (Denmark, Ireland, Latvia, Romania and Spain), which makes it more difficult to reduce afterwards.

To achieve the 80-95 % GHG emission reduction by 2050 or climate neutrality as early as possible a significant additional efforts are needed. Therefore, a clear commitment for a low carbon development and legally adopted action plans should be of highest priority to avoid either high-cost solutions or risk missing the mitigation target.

3 Key Issues for Developing Strategies

On the basis of the assessment carried out, the following elements could be considered when developing a low-carbon development strategy:

- **Institutional arrangements:** Which institutions are involved in the preparation of the LCDS? Which institutions are relevant for implementation of the action? What is the process for the preparation of the LCDS (e.g. stakeholder consultation, reviews, etc.)?
- **Type of document:** Is the LCDS to be understood as strategy, as legally binding document, as guidance for policy makers, as non-binding declaration of intent, as a feasibility study, as a Memorandum of Understanding, as a scenario analysis, or any other?
- **Legal Status:** Which legal status does the LCDS have? Is it legally binding, has it been approved by the national government? Which legal status is envisaged?
- **Target description:** What is the target for 2050 (quantitative and/or qualitative)? How does the target fit the EU 2050 objective? Are there interim target or target paths? Any sectoral targets?
- **Description of past and projected emission trends:** How did emissions evolve in the past? How are the projected emissions (WEM and WAM scenario) linked with the LCDS target?
- **Implementing Actions:** Which actions are needed to implement the LCDS? And what is the timeframe for these actions?
- **Consistency with other reporting obligations,** in particular National Climate and Energy Plans, policies and measures and GHG projections, etc.
- **Sectoral Emissions:** Which sectors contribute to the achievement of the targets and how? Are there any sectoral targets? What are the sectoral emission reduction measures?
- **Key actions:** What are the key actions of the LCDS and how are they implemented (type of policy instruments)? E.g. renewables, energy efficiency, electromobility, CCS, nuclear, etc.
- **Impact assessment:** Which impacts are expected? Socio-economic impacts, transformation of society, employment, trade, technology, etc.
- **Financial aspects:** What are financial implications of the LCDS? How will the changes in the system be financed? Are cost-benefit analyses available? Which investments are needed? Are there specific funds?
- **Monitoring:** Are there mechanism installed to monitor the progress described in the LCDS?
- **Updates of LCDS:** Are regular updates of the LCDS planned?
- **Public access:** Where can the public access information about the LCDS and its progress? Are the links working?
- **Public participation:** Has the public been involved in the preparation of the LCDS? If yes, how?

4 LCDS Summary per Member State

This chapter presents country fiches for the reported strategies of all 28 Member States. Each country fiche is designed to be a brief summary of the assessment findings for each Member State. It is structured as follows:

- **Name of LCDS and status:** Here the information submitted by MS in the years 2015, 2016, 2017 and 2018 is summarized. This includes the title of the national Low Carbon Development Strategy, the weblink, legal status, entities involved and other procedural information (if available).
- **Long-term vision of the MS:** In this section the long-term vision of the Member State is given. The main focus lies on the development pathways and the assumptions and targets behind them. Furthermore, information on concerned sectors, key instruments and implementation is presented.
- **Key policies and measures of the strategy:** Here the main policies and measures are listed, but in most cases this is not exhaustive. The objective is to show which sectors are targeted, and what are the main actions or plans to meet the long-term objectives.
- **GHG emission trend and available targets (kt CO₂eq)** shows the past emission trend⁹ (1990-2015), projections¹⁰ until 2035, and any targets until 2050 – if included in the national strategy.
- **Conclusions:** The last part summarizes the ambition(s), highlights specific issues, and shortly describes if the MS seems to be on track to meet the 2050 goal or if further efforts might be needed.

⁹ Data source: EEA GHG data viewer, 07.03.2018 (<http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>)

¹⁰ GHG projection data set 2018, 04.11.18411.2018 (<https://www.eea.europa.eu/data-and-maps/data/greenhouse-gas-emission-projections-for-4>)

4.1 LCDS Summary for Austria

Name of LCDS and status

2015: The Austrian Submission on the 8th January 2015 was a summary of the status on the LCDS topic. The official template was not used. There were several stakeholder processes and strategies on regional level mentioned, but the core document of the submission is the feasibility study [Energieautarkie für Österreich 2050](#). This study was prepared in 2010 and there were no extensive legal measures taken for an implementation of the concept. Additionally the GHG scenario tool [2050 pathway calculator](#) for Austria should move on the discussion process on development strategies to low carbon society.

2017: On 15th March 2017 Austria provided an update related to 2015. Austria started the process to elaborate an Integrated Climate and Energy Strategy. As a first step a Green Book [Grünbuch für eine integrierte Energie- und Klimastrategie](#) was published and followed by a public and stakeholder consultation process. The planned strategy will focus on 2030 targets and present 2050 perspectives.

2018: no update submitted

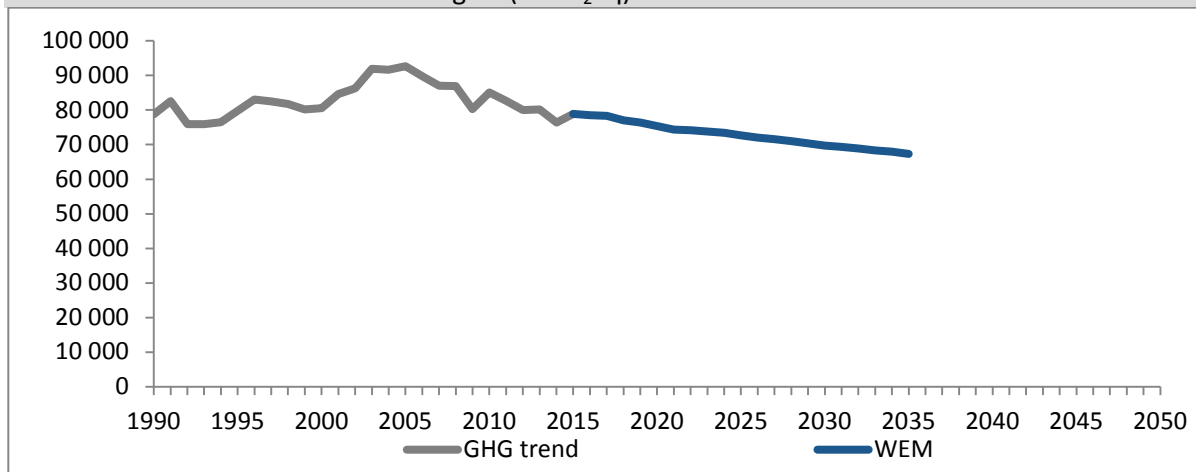
Long-term vision of the MS

The Green Book presents the first step towards the development of an Integrated Climate and Energy Strategy, and cannot be regarded as a Low Carbon Development Strategy. It summarises the status quo of GHG emissions, as well as energy supply and consumption, and presents various scenario until 2050.

Key policies and measures of the strategy

Specific policies or measures are not mentioned.

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, no LCDS target reported

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Neither the information submitted in 2015 nor 2017 can be regarded as a Low Carbon Development Strategy, as the first one has the character of a feasibility study and the second one is Green Book for the elaboration of an Integrated Climate and Energy Strategy.

In case Austria seeks to achieve a reduction of 80-95 % by 2050, effective additional measures will be needed.

4.2 LCDS Summary for Belgium

Name of LCDS and status

2015: Belgium submitted the template and an additional document entitled "[Belgian low carbon development strategy \(LCDS\) Status of implementation](#)" on 8th January 2015. In this document Belgium presents the current vision concerning a LCDS in a country where responsibilities and decision power are shared between different authorities (Federal State and Regions). It also provides a review of already existing climate policies with short- (2020), mid-term (2030) objectives as well as elements of legislation at Federal, national and/or Regional levels that may be considered as early actions with a view to 2050.

2017: In 2017, Belgium reported on current developments in establishing a LCDS on federal level, but also for the Brussels Capital Region, Walloon Region and Flemish Region. On federal level, a national debate on carbon pricing in the non-ETS sector was started, and the project "[Belgium's transition to a low carbon society by 2050](#)" made progress. It pursues a two-fold objective: (1) To contribute directly to drawing up a Belgian low carbon strategy entirely within the context of sustainable development, and (2) In the spirit of 'transition management', to encourage and fuel reflection and initiatives in this field in order to promote exchanges between as many actors as possible.

2018: no update submitted

Long-term vision of the MS

On **federal level** the debate on carbon prices, as well as the project "Low Carbon Belgium by 2050" show that a low carbon development until 2050 is considered, although clear targets and policies are not provided.

The **Flemish Region** elaborated its Flemish Mitigation Plan (2013-2020) further by integrating medium (2030) and long-term (2050) pathways supporting a 80-95% GHG emission reduction compared to 1990. Concrete policy recommendations have been elaborated and in 2016 the [Flemish Climate and Energy Pact](#) was signed.

The **Walloon Region** has a [Climate decree](#) establishing a procedure to allocate emission budgets per 5-year periods, describing trajectories towards emission reductions of 80 to 95% between 1990 and 2050. In 2015 the new [Climate Energy Plan 2016-2022](#) was adopted by the Walloon government containing 142 concrete measures.

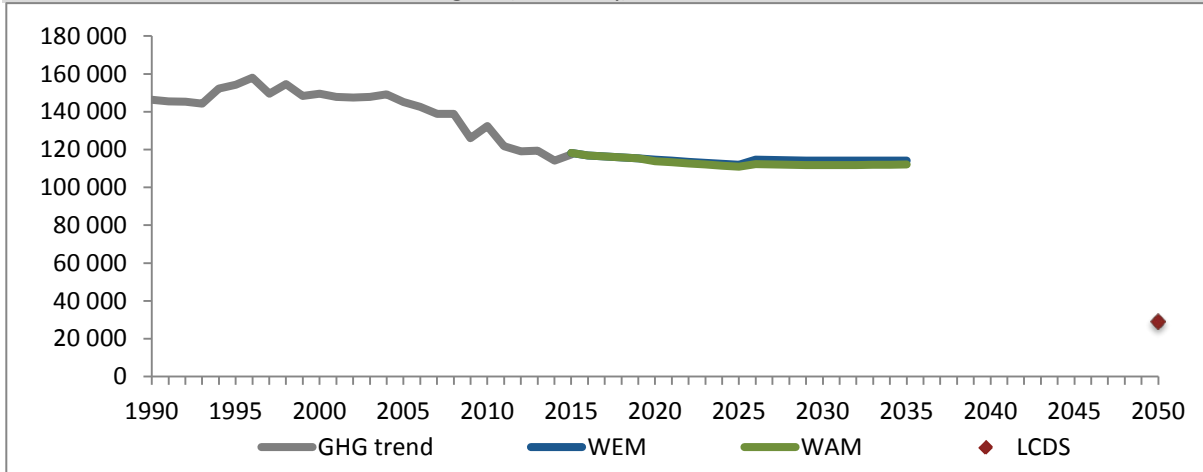
Brussels Region has adopted an Air-Climate-Energy Plan, which intends to help Brussels achieve its 30% reduction (40%/capita) of CO₂ emissions between 1990 and 2025.

Key policies and measures of the strategy

- Integration of climate into Renovation Pact for the residential sector (Flemish Region)
- Spatial Policy Plan (Flemish Region)
- Introduction of emission budgets (Walloon Region)
- Good food strategy (Brussels Capital Region)
- Regional Circular Economy Program (Brussels Capital Region)
- The Air-climate energy plan (Brussels Capital Region)

The plans/programs mentioned do not coincide with the ones in the EEA PAM database, but several policies such as the improvement of the energy efficiency in buildings can be related to the federal and regional strategies.

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, WAM - projections with additional measures, LCDS – Low Carbon Development Strategy’s objective

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Belgium made at federal and regional level progress in achieving a low carbon development. Although concrete plans up to 2050 are still missing, short to medium plans have been elaborated and also adopted by regional governments. It is interesting to note that the strategies have a wide focus such as spatial planning, food strategy, emission budgets, circular economy program and awareness raising. According to the past emission trend and projected emissions, effective additional efforts will be needed to achieve a reduction of 80-90 % by 2050.

4.3 LCDS Summary for Bulgaria

Name of LCDS and status

2015: Bulgaria reported in 2015 information on LCDS and provided updates in 2016 and 2017. The report referenced throughout is the [National Action Plan on Climate Change \(NAPCC\) for the period 2013-2020](#), published and adopted in 2012. It is a well-structured and transparent plan covering international, EU and national legislation, sectoral measures, economic and GHG projections, as well as monitoring and reporting.

2016: Bulgaria informed that an update is planned, but a time schedule is no set yet.

2017: Bulgaria provided some more details, but the National Action Plan on Climate Change from 2012 is still the central document.

2018: no update submitted

Long-term vision of the MS

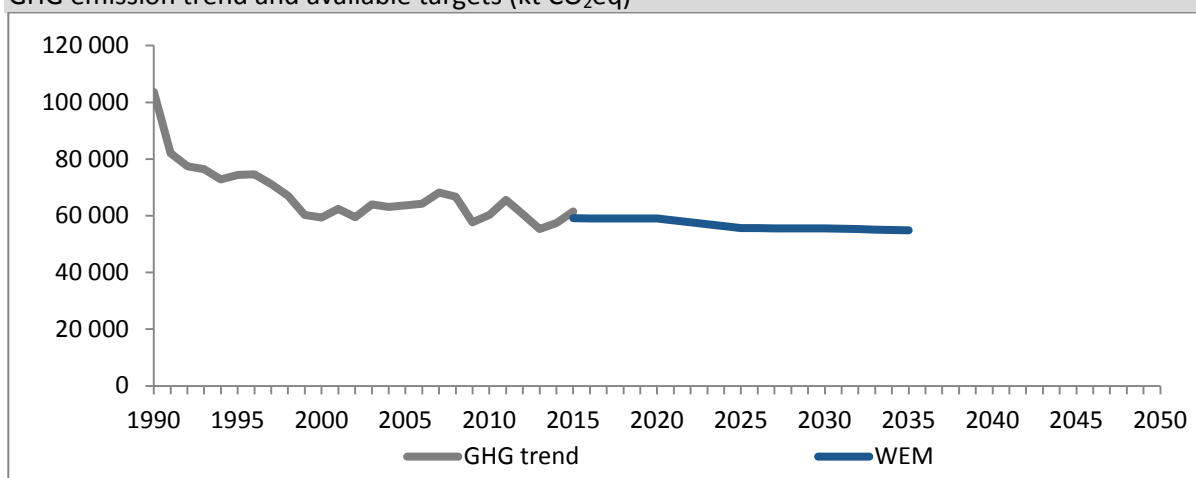
As the report covers only the time until 2020, there is no long-term vision described. Measures for all sectors are described, whereby the highest potential for GHG mitigation is within the sectors energy (mostly change from coal to gas), waste (capture of biogas) and industry (biomass use for combustion), whereby cost efficiency has been taken into account. Measures in the transport sector show the highest costs per ton CO₂ eq. reduced. No specific targets beside the 2020 target according to the ESD are mentioned.

Key policies and measures of the strategy

The NAPCC lists measures for all its sectors, distinguishing between measures with direct and indirect impact on the reduction of GHGs. Measures within sectors have been clustered along priority axis, such as “low carbon production of electric energy from coal-fired power plants”. The following measures could be identified as key measures, as they have the highest mitigation potential.

- Fuel Substitution from coal to natural gas
- Improvement of production efficiency in existing coal-fired power plants
- Construction of installation for mechanical and biological treatment (MBT) and installations for treatment and recovery of compost and biogas
- Use of biomass in the combustion units of installations
- Introduction of intelligent transport system in republican road networks as well as urban environment

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, no LCDS target reported

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

The report provided contains well-structured and detailed information on the legislation, financial mechanisms and actions planned until 2020 to limit GHG emissions. But as the timeframe of the document is only until 2020, it cannot be considered a Long-term development strategy.

Although significant emission reductions have already been achieved in the past, additional efforts will be needed if a reduction of 80-95 % by 2050 is intended.

4.4 LCDS Summary for Croatia

Name of LCDS and status

2015: Croatia has submitted the reporting template in 2015, but did not provide a LCDS report. It supplied a link to the homepage of the Ministry of Environment and Nature (currently Ministry of Environment and Energy) where updates should be provided in the future. Croatia established framework for developing a Low Carbon Development Strategy. On the homepage of the Ministry results of the development steps as well as many documents about the process of establishing a LCDS itself can be found in Croatian.

Adoption of the LCDS in the Croatian Parliament was expected in 2015. The prepared report, which was presented on 18.12.2015, has not been approved and is still under preparation as indicated in a [press release](#) from 02.05.2016. More recent information on the progress has not been found.

2016: no update submitted

2017: information on LCDS has been submitted as a part of the [GHG projections report](#). In 2016 a draft of the Low-carbon development strategy of the Republic of Croatia for the period until 2030 with a view to 2050 was drafted. Due to the significant changes in the circumstances in energy policy and policy of sustainable waste management, decision was made that the revision of the prepared technical basis and draft of the Low-carbon development strategy was necessary. In addition, given that the Strategy has an impact on all sectors of the economy, it is necessary to further align it with other strategic documents for the period up to 2030, with a view to 2050 such as for example new Energy Development Strategy...

2018: no update submitted

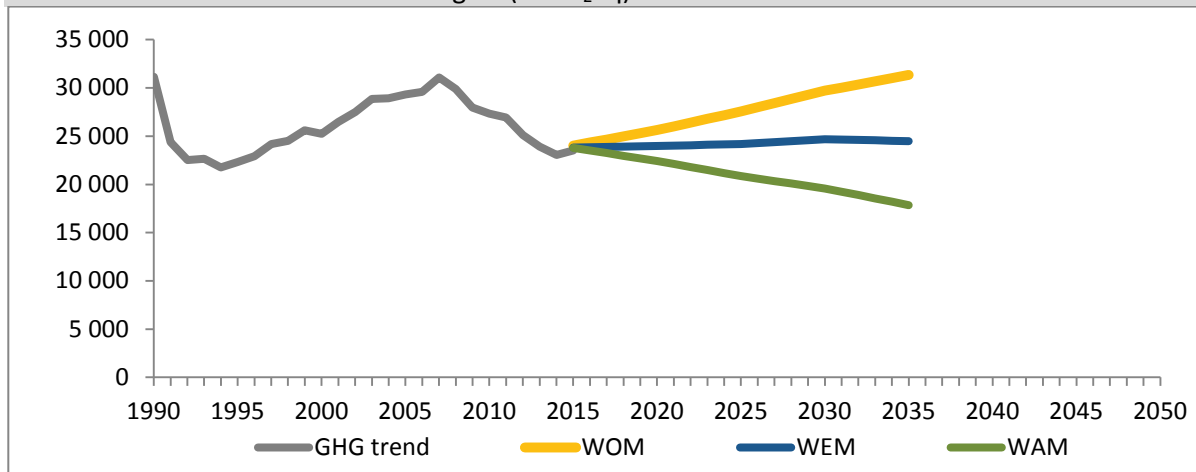
Long-term vision of the MS

The LCDS has a timeframe until 2030 with a view to 2050 and it has not been formally submitted since it has not been adopted yet.

Key policies and measures of the strategy

Not applicable

GHG emission trend and available targets (kt CO₂eq)



Note: WOM - projections without measures, WEM - projections with (existing) measures, WAM - projections with additional measures, no LCDS target reported

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Croatia has not submitted a low carbon development strategy since it has not been adopted yet. There is a draft LCDS that has a timeframe until 2030 with a view to 2050.

4.5 LCDS Summary for Cyprus

Name of LCDS and status

2015: Cyprus has submitted the reporting [template](#) and a draft version of the LCDS ('[THE LOW-CARBON DEVELOPMENT STRATEGY OF CYPRUS](#)') in 2015. It was planned for a public consultation, any revision adoption by the Council of Ministers in the first half of 2015.

As of 29.03.2018 no final LCDS can be found on the website of the Department of Environment.

2016, 2017, 2018: the submitted projections reports contains a paragraph detailing that no changes to the strategy submitted in 2015 have been made

Long-term vision of the MS

The LCDS is conceived as a framework for action and government involvement in low-carbon development until the year 2050, with the long-term vision to reduce net emissions of greenhouse gases by introducing appropriate additional policies and measures.

The LCDS entails four principal objectives:

- a) Cyprus will fulfil its international obligations according to the United Nations Framework Convention on Climate Change, the Kyoto Protocol and the legal framework of the European Union.
- b) Greenhouse gas emissions will be reduced, with a special emphasis on reducing the use of fossil fuels in favour of renewable energy sources, energy efficient and climate-friendly technologies.
- c) The government will attempt to increase carbon sequestration from the atmosphere through afforestation, re-vegetation, and changes in land use.
- d) The government will foster research and innovation in fields related to climate change affairs.

Cyprus does not mention quantifiable targets in terms of GHG reductions for the future and concerning Cyprus itself, apart from a 5 % reduction in the non-ETS sector until 2020.

Key policies and measures of the strategy

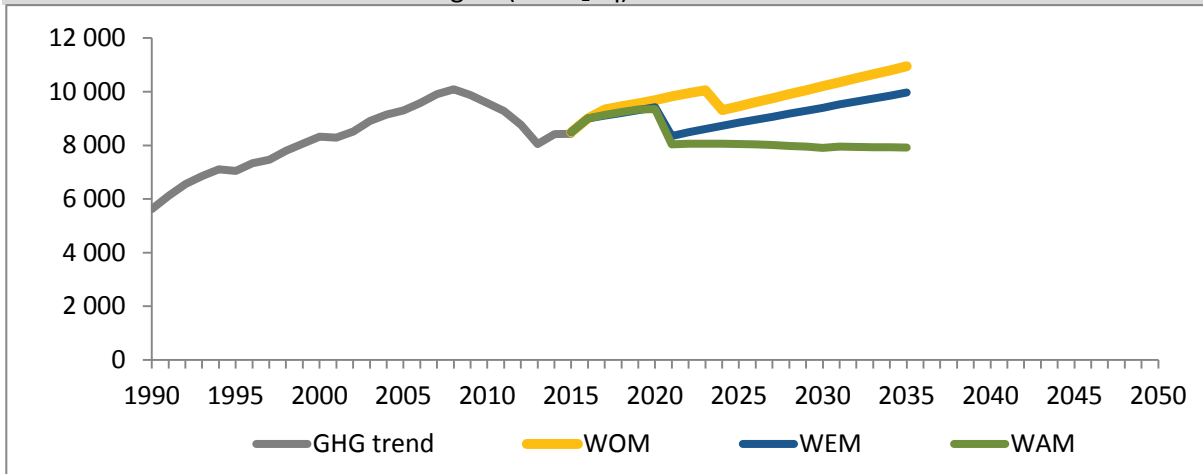
Measures aimed at reducing greenhouse gas emissions constitute the most important aspect of the government's climate change strategy.

The largest emitter in Cyprus is energy, followed by transport. This trend is expected to remain unchanged as long as there are no infrastructural changes.

Measures (selection):

- Expand domestic energy sources and exploit our natural gas, in particular to reduce dependence on oil imports. This approach shall make the energy system more efficient and less carbon intensive.
- Increase the penetration of renewable energy sources, to the extent that the power distribution system allows.
- Incentivise the implementation of energy efficiency measures for industry, businesses, households, transport and the public sector.
- Provide incentives to the public and businesses to utilize more energy-efficient technologies and practices.
- Continue to encourage the purchase of climate-friendly motor vehicles and the use of climate-friendly fuels.
- The government is promoting the use of energy saving and climate friendly transport systems.
- Education and public participation: Work will be done to prepare educational materials in co-operation with non-governmental organisations and stakeholder organisations so as to inform the public of the greenhouse effect and the measures that can be adopted to reduce it.

GHG emission trend and available targets (kt CO₂eq)



Note: WOM - projections without measures, WEM - projections with (existing) measures, WAM - projections with additional measures, no LCDS target reported

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Cyprus submitted information on its Low Carbon Development Strategy in 2015, but no updates ever since. Also in 2018, the draft LCDS of 14 pages from 2014 has not been changed. A further development of the strategy including concrete qualitative and quantitative targets, as well as means how these targets are achieved, is missing.

If an emission reduction of 80-95 % by 2050 is intended by Cyprus, additional efforts will be needed.

4.6 LCDS Summary for Czech Republic

Name of LCDS and status

2015: The Czech Republic submitted the template and the LCDS [National Programme to Abate the Climate Change Impacts](#) on the 8th January 2015. The LCDS was adopted in 2004. It is the continuation of the Strategy for Protection of the Climate System of the Earth in the Czech Republic. In 2015, the Czech Republic reported that a new [Climate Protection Policy](#) is under preparation.

2017: Czech Republic informed about the update and adoption of the Climate Protection Policy in 2017. The update, i.e. the new Climate Protection Policy of the Czech Republic, reflects significant recent developments at the EU, international and national level. The long-term perspective for low emission development and transition until 2050 was included for the first time. The implementation of the Climate Protection Policy will be evaluated by the end of 2021 and updated by the end of 2023.

2018: no update submitted

Long-term vision of the MS

The policy aims to determine an appropriate mix of cost-effective policies and measures in key sectors that will lead to achieving greenhouse gas reduction targets: primary emissions reduction targets for 2020 and 2030, and long-term indicative emission reduction targets. The intended maximum emissions of the Czech Republic in 2050 correspond to at least 80% emission reduction compared to 1990 levels, i.e. 39,1 Mt CO₂eq. It is stated that this will need fundamental structural and technological changes in all sector of the national economy. In order to propose concrete measures eight scenarios until 2050 have been compiled on the basis of a CO₂ calculator. These scenarios consider the following aspects: State Energy Policy, nuclear scenario, green scenario, economic recession scenario, electricity and biomass import, CCS technology, renewable energy. The conclusion is that the 2050 target can only be achieved with a combination of different measures.

Key policies and measures of the strategy

A separate chapter lists the following key policies per sector:

Industry:

- EU-ETS
- Directive 2010/75/EU on industrial emissions (IED), State Environmental
- Policy of the Czech Republic 2012–2020, and amendment to Act No 406/2000 Coll., on energy management

Energy Consumption:

- Reducing energy intensity in buildings for housing and other buildings
- Implementation of energy management ISO 50001
- Directive 2010/31/EU on the energy performance of buildings
- National Action Plan for Energy Efficiency (NAP EE)

Transport:

- Transport Policy of the Czech Republic (for the period 2014–2020, with a perspective until 2050) and the Action Plan for Clean Mobility. These strategies envisage a gradual increase in the share of alternative propulsion and fuels in road transport and further electrification of railways, a gradual shift of freight transportation from road to rail or water transport.

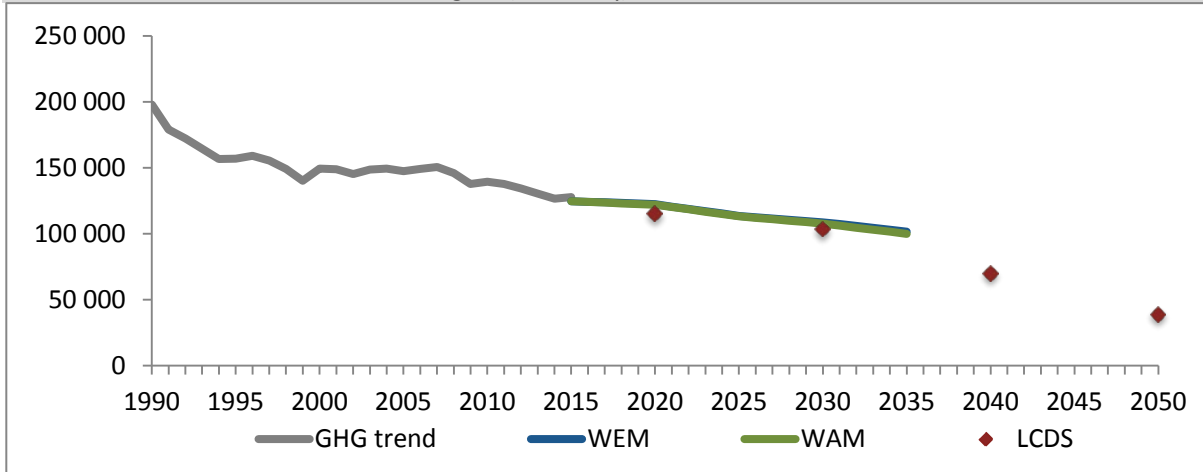
Agriculture and Forestry:

- Increased use of carbon sinks
- Action Plan for Biomass in the Czech Republic: achieve by 2020 annual production of energy from agricultural land and agricultural products
- Local support for afforestation of agricultural land provided by Rural Development Program

Waste

- Waste Management Plan of the Czech Republic for the period 2015–2024: establish a legislation to ban landfilling of mixed municipal waste recyclables and reusable waste (starting in 2024)

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, WAM - projections with additional measures, LCDS – Low Carbon Development Strategy's objective

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

The Czech Climate Protection Policy can be regarded as Low Carbon development strategy as it lays down the targets, and also provides information how these targets will be achieved. Several national sectoral strategies have been elaborated to ensure the continuous reduction of greenhouse gas emissions. Also financing climate protection measures in developing countries is part of the policy. According to the past emission trend and projected emissions, the Czech Republic seems to be on track to meet its targets.

4.7 LCDS Summary for Denmark

Name of LCDS and status

2015: Denmark submitted the template and a [Memorandum](#) on the LCDS status on 12th January 2015. The most important documents related to the LCDS are:

- “A Denmark That Stands Together” of 2011, which includes ambitious targets for climate and energy policy to assist the low-carbon development strategy as formulated by the Danish government.
- This was followed-up by the energy plan “Our Future Energy” in 2011, and the “[Danish Climate Policy Plan](#)” of 2013.

The objectives of Denmark’s LCDS are set in the 2011 Government Platform. The 2013 Climate Policy Plan takes stock of the progress towards the targets in Denmark’s LCDS and includes an assessment of the projected cost and benefits associated with the implementation of the potential additional policies and measures analysed.

2016: Denmark submitted a [Memorandum](#) “Denmark’s intermediate update on the low-carbon development strategy, climate policies and measures and greenhouse gas projections”.

The objectives of Denmark’s LCDS in the 2015 Government Platform include the following long-term target and near-term actions:

- Denmark to be independent of fossil fuels by 2050
- The Government will set up an energy commission with the task of preparing a proposal for energy policy targets and measures for the period 2020-2030

Denmark’s LCDS is part of the government’s energy and climate policy and is therefore – in itself not legally binding. However, most of the concrete actions needed for the implementation of the LCDS require implementation through new legal acts or changes in existing Danish legislation.

The 2015 Government Platform presenting the governments LCDS for Denmark was made available to the public through publication on the website of the prime minister’s office (www.stm.dk). The follow-up decisions, documents and legislation have been, and will continue to be, published on the web-site of the Danish Ministry of Energy, Utilities and Climate (www.efkm.dk) or the Danish Energy Agency (www.ens.dk).

2017: The low carbon development strategy is formulated within [Government Platform 2016](#), setting the long-term target and near-term actions. The LCDS is part of the government’s energy and climate policy and is therefore – it itself – not legally binding. However, most of the concrete actions needed for the implementation of the LCDS require implementation through legal acts or changes in existing Danish legislation. In 2014, a Climate Change Act was adopted, which installed a Climate Council, regulates monitoring and requires the setting of GHG reduction targets once every five years – with a ten-year perspective to meet the ambition level for 2050.

2018: no update submitted

Long-term vision of the MS

The long-term goal for Denmark is to be a low-emission society independent of fossil fuels by 2050, thereby supporting the Paris agreement and the EU ambition with a GHG emission reduction of 80-95% by 2050. The government pursues an ambitious green transition in a sustainable and efficient manner where the interest of Danish jobs and competitiveness goes hand in hand with respect for the environment and climate.

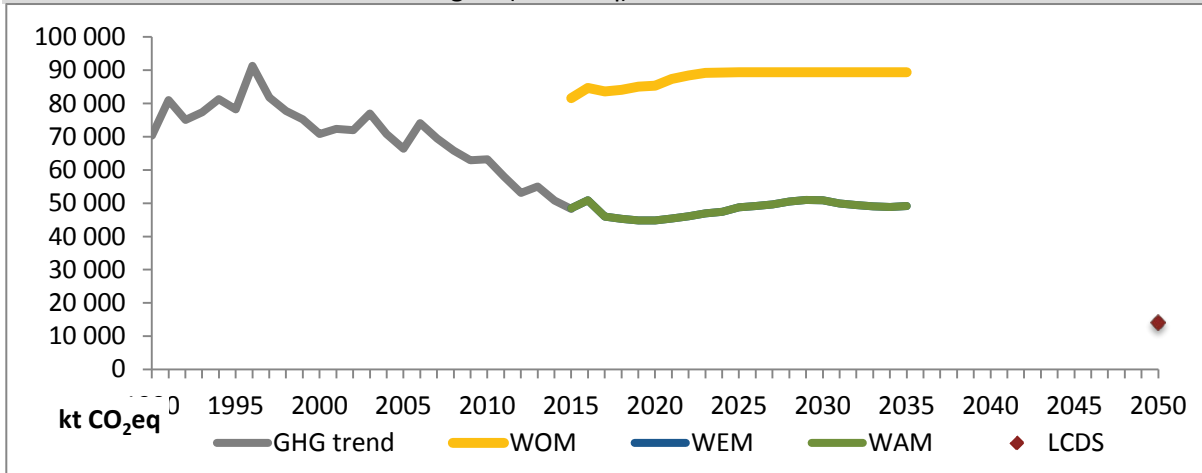
Key policies and measures of the strategy

The objectives regarding low carbon development listed in the Government Platform 2016 are:

- Denmark to be a low-emission society independent of fossil fuels by 2050
- The Government will pursue a target of at least 50 per cent of Denmark’s energy needs to come from renewable sources by 2030.
- New Energy agreement for after 2020 to ensure continued transformation in the energy sector

- Screening for possible locations for additional offshore wind
- Action Plan for smart energy
- Strengthen energy research
- Introduction of blending requirement of 0.9% advanced biofuels in fuel for land transport
- Development of Climate Change Plan bringing together government's initiatives on climate

GHG emission trend and available targets (kt CO₂eq)



Note: WOM - projections without measures, WEM - projections with (existing) measures, WAM - projections with additional measures, LCDS – Low Carbon Development Strategy's objective

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Denmark's long-term goal and mid-term objectives are set in the Government Plan 2016, where the Low Carbon development strategy is included. As this plan is not legally binding, several concrete actions are or will be included in national legislation (e.g. Climate Change Act).

The focus is on the energy supply sector, and other sectors such as industries, agriculture, and forestry are not taken into account. Also the needed transformation of society and behaviour is hardly elaborated. Progress in the share of renewable energy in energy consumption is monitored.

Regarding the past emission trend and projections until 2035, additional efforts will be needed to achieve the long-term goal for 2050.

4.8 LCDS Summary for Estonia

Name of LCDS and status

2015: Estonia submitted the template on 8th January 2015, but their LCDS “Fundamentals of Estonian Climate Policy” is still in development. It will be a short, high-level, umbrella document to provide input into sectoral policy strategy documents. The adoption of the LCDS is planned by the end of 2016.

2017: Estonia developed a Low Carbon Development Strategy named “[General Principles of Climate Policy until 2050](#)” (GPCP), which was approved in 2016, and has been adopted by the Parliament in 2017. It prescribes political guidelines for the sectors energy and industry, transportation, agriculture, forestry and land use, as well as adaptation.

2018: Estonia informed that with the adoption of the GPCG 2050 all new sectoral and cross-sectoral strategies and developments have to follow the principles set in the GPCP 2050.

Long-term vision of the MS

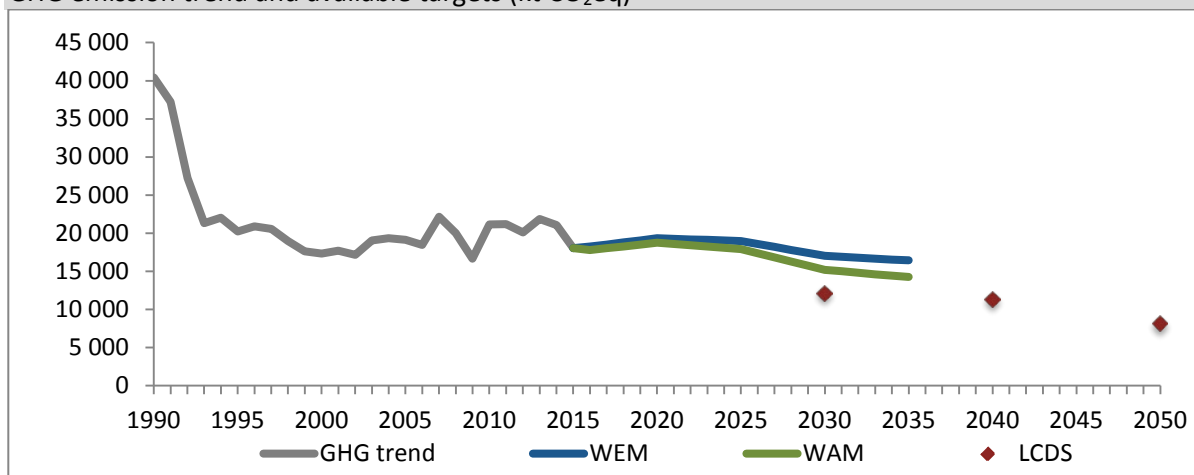
The vision of Estonia is to be a competitive economy with low carbon dioxide emissions in 2050. The long-term target of Estonia is to reduce the emission of greenhouse gases by 2050 by 80 % (compared to 1990). As the country moved towards this target, emission will be reduced by about 70 % by 2030 and by 72 % by 2040.

Key policies and measures of the strategy

The following principles have been included to the sectoral policy guidelines:

- Energy and industry: efficient interaction between energy consumption and production (→electricity grids), low carbon technologies for industrial processes, renovating building stock (→ maximise energy efficiency), efficient energy and heat networks, environment friendly use of oil shale, use of domestic renewable energy sources.
- Transportation: settlement and transport management, energy efficient traffic culture, investment and tax policies.
- Agriculture: maintain and increase soil’s carbon stock, efficient and ecological use of agricultural land, replacement of mineral fertilisers with organic fertilisers, production of bioenergy.
- Forestry and land use: forest growth, carbon sequestration, increased use of timber replacing non-renewable natural resources, preservation of forest land.
- Adaptation: awareness raising of stakeholders, reduce adverse health effects, resilience of settlements.

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, WAM - projections with additional measures, LCDS – Low Carbon Development Strategy’s objective

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Estonia is committed to reduce its GHG emissions by 80 % until 2050, and has it incorporated in the Government Plan, as well as mid-term goals for 2030 and 2040. Sectoral policies and measures, or concrete actions are missing, only policy guidance is provided. A review is foreseen every four years, as well as updates if necessary. According to projected emissions until 2035, the 2030 target will be missed, but the 2040 and 2050 target seems within reach.

4.9 LCDS Summary for Finland

Name of LCDS and status

2015: Finland submitted the template and LCDS on 8th January 2015, which consists of [the National Energy and Climate Strategy \(2013\)](#) and the [Energy and Climate Roadmap 2050](#) (2014). The National Energy and Climate Strategy is an update to the Long-Term Climate and Energy Strategy (2008), and will likely be replaced by a national plan for competitive, secure and sustainable energy, which should be operational “well before 2020”.

2017: Finland reported that the Energy and Climate Roadmap 2050 is still valid, and in the meantime the Finnish Government approved the national Energy and Climate Strategy for 2030 in 2016. In 2017, a Government Report on [Medium-term Plan for Climate Change Policy Plan for 2030](#) was published by the Ministry of Environment. Together with the Energy and Climate Strategy completed at the end of 2016, the plan implements the climate and energy policy objectives set in the Government Programme. The medium-term plan assesses what kind of measures should be taken to reduce the gap relating to emissions not included in the ETS, also taking account of the factors of uncertainty. The emissions reduction measures included in the plan also support the attainment of the long-term emissions reduction objective, i.e. the objective set to 2050.

2018: no update submitted

Long-term vision of the MS

Finland’s long-term goal is to be a carbon-neutral society, which will be achieved by focusing on energy through the Energy and Climate Roadmap 2050. Approximately 80 % of Finland’s GHG emissions arise from energy production and consumption (transport included), so the Roadmap focuses on increasing energy efficiency, increasing the share of renewable energy, and increasing energy security:

- 20 % reduction GHGs from 1990 by 2020
- 38 % share of renewable energy by 2020
- 20 % increase in energy efficiency from 2007 by 2020
- 80 to 95 % reduction in GHGs from 1990 by 2050

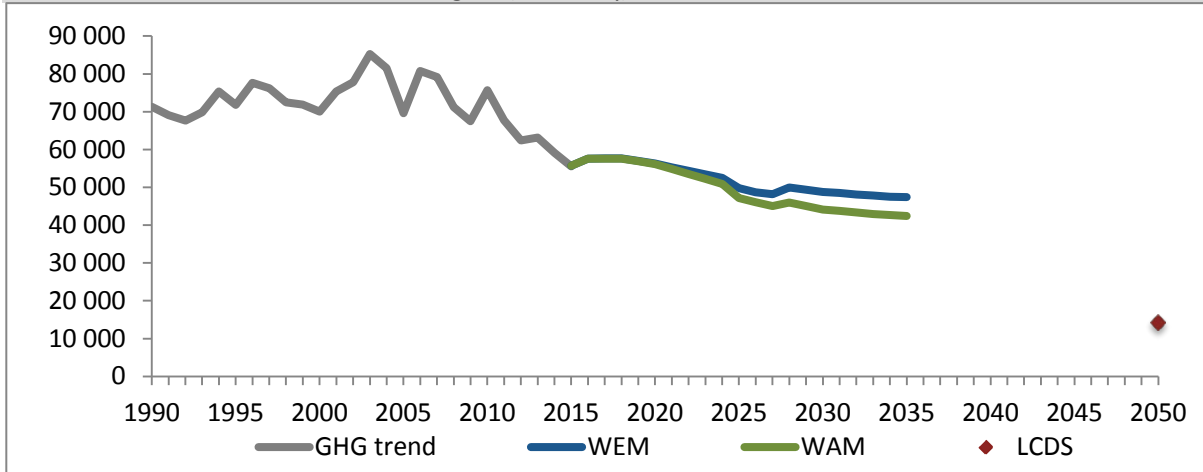
The Roadmap is clear that to meet the 80 to 95 % reduction target, the commercialisation of carbon capture and storage (CCS) technology must be realised.

Key policies and measures of the strategy

The policies and measures in Finland’s LCDS focus on the energy sector, particularly energy efficiency and renewable energy, but also include other sectors, such as waste:

- Energy Efficiency Directive
- EU ETS
- Energy efficiency in transport
- Promotion of wind power
- Zero energy buildings
- Waste Act

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, WAM - projections with additional measures, LCDS – Low Carbon Development Strategy’s objective

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Finland is committed to the long-term reduction goal of -80-95% reduction by 2050, and its roadmap serves as a strategic-level guide on the way toward a carbon-neutral society. Its focus is on energy production, energy systems, energy efficiency and energy use in transport, buildings; e.g. it sets targets like by the end of 2020, all new buildings must be nearly zero-energy houses. The government program is supplemented by the Medium-term Plan for Climate Change Policy Plan for 2030, which assesses and sets measures to support the long-term objective.

Regarding the past emission trend and the projections a continuous emission decrease is visible, but further ambitions will be necessary to reach the 2050 goal.

4.10 LCDS Summary for France

Name of LCDS and status

2015: France submitted its [Stratégie Nationale Bas-Carbone \(SNBC\)](#), which has been adopted in November 2015.

2016: On 15th March 2016, France informed on updates. The most important change was that the law ‘transition énergétique pour la croissance verte’ (Energy transition for green growth) was adopted, which establishes the tools necessary to achieve this transition: the LCDS and „carbon budgets“.

2017: France informed about the reform of the energy-climate governance, which sets the legal basis for establishing the low carbon strategy together with a multiannual energy program.

2018: no update submitted

Long-term vision of the MS

The French LCDS is an elaborate strategy document with a clear target to reduce GHG emissions in all relevant sectors, including agriculture, waste and LULUCF. The document presents a horizontal strategy and sector specific strategies to achieve the transition to a low-carbon economy.

France aims to reduce GHG emissions by at least 40 percent by 2030 and 75 percent by 2050 – both relative to 1990. The target for 2050 is below the target the EU has proposed in the roadmap for 2050, but per capita emissions in France are already relatively low compared to other EU Member States.

The main instrument to achieve the targets is the introduction of carbon budgets, which sets emission targets for all sectors (excluding LULUCF) for four year periods. For the period 2015-2019, 2020-2023 and 2023-2028 these have already been determined and adopted. For the period after 2029 LULUCF will also be included. For horizontal aspects and for each sector a strategy is developed in the LCDS that would ensure the French transition to a low carbon society. Horizontal aspects include for instance financing, R&D, education and urban planning.

Key policies and measures of the strategy

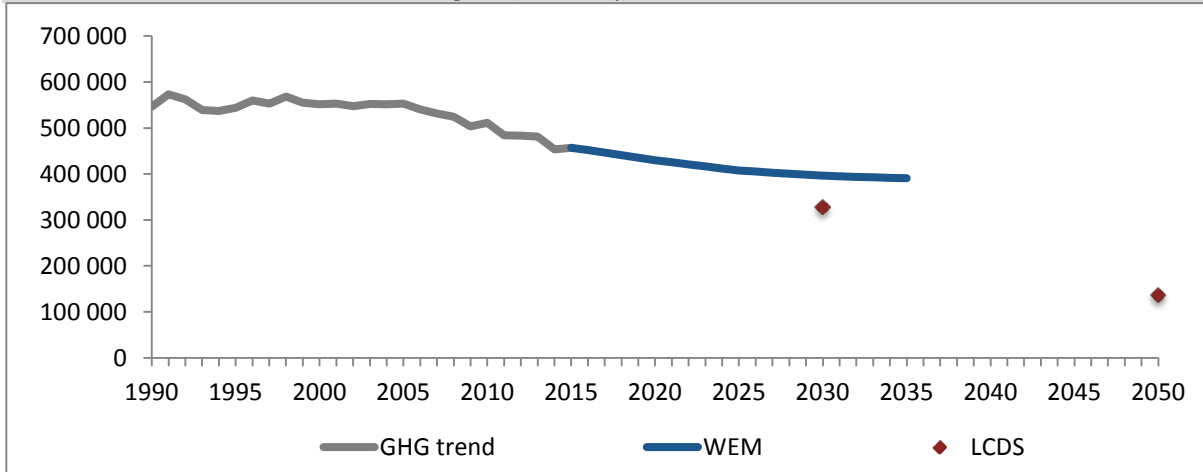
The key overarching policy instrument is the Carbon Budget, which ensures that France achieves the different targets.

The sectoral strategies include actions and changes that are required to achieve the targets, with a horizon of 2030 and 2050. They mostly do not include specific policies, but rather includes quantitative and qualitative objectives for each sector in order to achieve the overall LCDS and emission reduction target.

Important policies that are specifically mentioned in the LCDS are:

- Carbon budgets for 2015-2018, 2019-2023 and 2024-2028
- Transport: improve energy efficiency, curb the demand for mobility, promote alternative to private car use, encourage modal shift
- Building: implement thermal regulation, renovate building stock, management of energy consumption
- Agriculture: develop crop-growing and livestock rearing, increase harvested wood amounts
- Industry: control energy and material demand, promote circular economy, reduce share of energy sources with high GHG intensity
- Energy: energy efficiency, renewable energy sources, improve flexibility of energy system
- Waste: reduce food waste, prevent waste productions, waste recycling
- Carbon capture and storage (CCS is seen in the LCDS as an element to achieve the 2050 target at lower cost)

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, LCDS – Low Carbon Development Strategy's objective

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

France has developed a robust and well elaborated low carbon strategy, where the key element are carbon budgets covering all sectors. Sectoral GHG reduction targets are defined, as well as sectoral policies. It not only covers technological challenges, but also recognises the importance of financial and societal barriers that need to be overcome. This strategy is linked to the key existing plans and programmes in this sector. A large set of indicators is proposed to monitor the transition, which includes indicators related to the achievement of the target (e.g. total and per capita GHG emissions, final energy consumption per unit of GDP), indicators of actions (e.g. amount of public and private investments to a low-carbon economy), indicators on socio-economic impact (e.g. energy cost to companies and households, green jobs) and indicators on environmental co-benefits (e.g. air pollution, efficient use of resources).

Regarding the past emission trend and the projections further efforts will be needed to achieve the 2030 target of -40%, and the 2050 target of -75% compared to 1990.

4.11 LCDS Summary for Germany

Name of LCDS and status

2015: Germany submitted on the 9th January 2015, the template and the LCDS named “[Energiekonzept der Bundesregierung](#)”, which was prepared in 2010. It was adopted in September 2010, extended and updated by a package of decisions and legislation as of 6th June 2011. 2014 the [first progress report](#) of the Strategy was published. The implementation of the strategy is also included in [Climate Action Program 2020](#), which was adopted in 2014. In 2016 Germany adopted the [Climate Action Plan 2050](#) based on the “Energiekonzept” which accounts for all relevant sectors and gases and will be supplemented by a programme of measures.

2017: Germany submitted on 13th March 2017, the template and the LCDS named [Klimaschutzplan 2050](#) (Climate Action Plan), which is an adopted cabinet resolution, and sets the principles and goals of the German government’s climate policy until 2050.

2018: no update submitted

Long-term vision of the MS

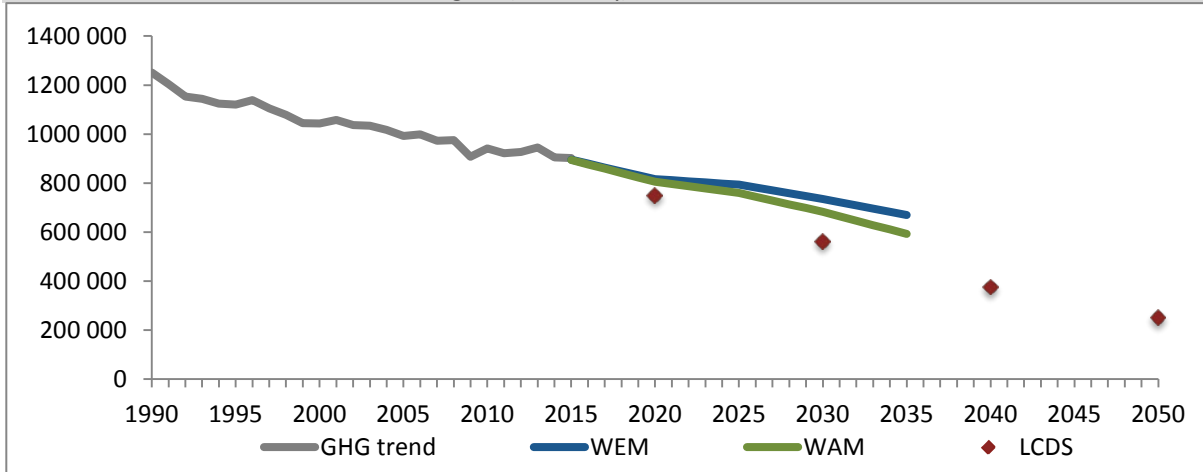
The German Climate Action Plan provides guidance to all areas of action in the process to achieve the domestic climate target in line with the Paris Agreement. It addresses the areas of action energy, buildings, transport, trade and industry, agriculture, land use, and forestry. It also sets out overarching targets and measures. Interim goals for 2030 are set for all sectors, accompanied by sectoral measures and strategies. Impact assessments of these will be carried out in 2018 to ensure that the progress is in line with the 2030 targets. The development path for the reduction of GHG until 2050 foresees at least minus 55% until 2030, minus 70% until 2040, minus 80% to 95% until 2050. The path towards greenhouse gas neutrality includes a transformation of the economy and society by 2050 and requires promoting climate action at all levels, which includes investments in greenhouse gas-neutral technologies, production processes and infrastructure, whereby the measures must include social justice, affordability and economic efficiency, participation and a vibrant democracy as fundamental criteria.

Key policies and measures of the strategy

GHG emission reductions in the **energy** sector are key, and energy supply must be almost completely decarbonised by 2050. This includes higher level of energy efficiency, energy and electricity from renewable sources (also for building, trade, industry and transport), which requires a modernisation of the energy system including grid infrastructure. In the **building** sector the implementation of the Climate-Friendly Building and Housing Strategy is fundamental, which also considers retaining affordable housing for all.

Measures in the **transport** sector are about financing research for new technologies, funding electric mobility, concepts to achieve climate friendly modal splits (e.g. needs-based infrastructure, smart multimodal integration of different transport modes). For the **industry** sector emission trading, the concept of circular economy, new breakthrough technologies for decarbonisation such as direct steel reaction using renewable energy or sustainable carbon capture and use technologies are relevant. For the **agriculture** sector a zero emissions are impossible, but the focus is on reducing emission and increasing resource efficiency by further reduction of nitrogen surpluses, more organic farming, increased fermentation of farm manure and agricultural residues and reduction of livestock emissions. For **LULUCF** the focus is on maintaining and improving the ability of forests to act as a sink and increasing the use of wood from sustainable forestry replacing non-renewable natural resources ([Charter for Wood 2.0](#)).

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, WAM - projections with additional measures, LCDS – Low Carbon Development Strategy's objective

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Germany prepared a well elaborated Climate Action Plan, with overall and sectoral objectives for 2030 and 2050 in line with the Paris Agreement. It covers all sectors (energy supply, buildings, mobility, industry and businesses, agriculture, land use and forestry) and provides for each sector guiding principles for 2050, transformation pathways, milestones and strategic measures. This Climate Action Plan was adopted by the German Cabinet in November 2016. Regular reviews and updates are foreseen through scientific contribution and a public dialogue process. A programme of measures to achieve the 2030 targets will be developed. Evaluation and monitoring are carried out annually, and a progress report (Climate Action Reports) are provided to the Bundestag.

According to the past emission trend and the projected emissions, further emission decreases are expected. The achievement of the 2030, 2040 and 2050 target will need additional emission reductions.

4.12 LCDS Summary for Greece

Name of LCDS and status

2015: Greece provided their [Energy Roadmap to 2050](#), published in 2012, and additional information for the other sectors in the template. The institution responsible is the Greek Ministry for Energy, Environment and Climate Change (YPEKA). The Roadmap itself has not been adopted by the government, but many measures included in the roadmap are implemented in national legislation, whereby these measures seem to expire by 2020.

2016, 2017, 2018: no update submitted

Long-term vision of the MS

The Energy Roadmap has the main objectives of reducing the dependence on imported energy, maximizing the penetration of renewables, achieving a significant reduction in emissions of carbon dioxide (CO₂) by 2050, as well as reinforcing the protection of final consumers. Simultaneously, zero use of nuclear energy and the very limited use of Carbon Capture and Storage technology (CCS) are in turn, key options for the above mentioned planning.

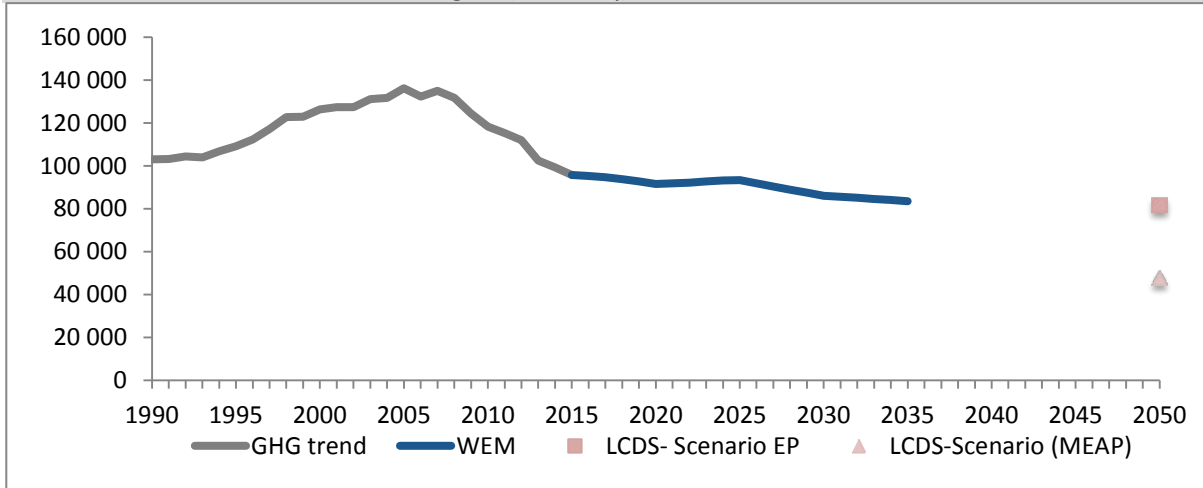
This has been analysed in four scenarios, whereby one assumes a conservative implementation of environmental and energy policies, anticipating on the one hand a moderate level of CO₂ emissions reduction by 2050 (40% compared to 2005), and on the other moderate penetration of RES and energy savings. The other – more ambitious scenario - assumes maximization of RES penetration (100% in electricity generation), so as to reduce CO₂ emissions by 60% to 70% by 2050 with simultaneous energy saving in buildings and transport. The same scenario is examined under the hypothesis of imported electricity which will result in cost savings in electricity sector (Scenario MEAP-a).

Key policies and measures of the strategy

The picture of the future energy system as indicated by the two basic energy policy scenarios (Scenarios MEAP and PEK) can be summarized in the following 10 points, whereby some of them find their counterpart in the PAMs already reported by Greece.

1. Reduce greenhouse gas emissions by 60% to 70% by 2050 in relation to 2005.
2. 85%-100% electricity generation from RES, using all commercially mature technologies.
3. Total penetration of renewables in gross final energy consumption by 2050 at a rate of 60% to 70%.
4. Stabilization of energy consumption due to energy saving measures.
5. Relative increase in electricity consumption due to electrification of transport and greater use of heat pumps in the residential and tertiary sectors.
6. Significant reduction of oil consumption.
7. Increased use of biofuels in transportation sector at the level of 31% to 34% by 2050.
8. Dominant share of electricity in short-distance passenger transport and significant increase in the share of stable track public transport.
9. Significantly improved energy efficiency for the entire building stock and a large penetration of RES in buildings.
10. Development of decentralized production units and smart grids.

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, LCDS-Scenario EP: -40% by 2050 compared to 1990, LCDS-Scenario MEAP: -60-70% by 2050 compared to 1990 (in figure -65%)

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Greece provided an energy roadmap considering various scenarios, including chapters on current status, objectives, scenarios, and a general description of policies and measures per energy sector (energy consumption, buildings, industrial sector, electricity sector, renewables, electricity and gas networks), as well as an assessment of costs. The energy roadmap 2050 has not been adopted by the Government. It is not clear if one of the analysed scenarios represents the long-term strategy for Greece.

Since 2015, no updates referring to the LCDS have been submitted.

Regarding the past emission trend and the projections, the national target of -60-70% can be met in 2050.

4.13 LCDS Summary for Hungary

Name of LCDS and status

2015: The Hungarian Low Carbon Development Strategy is under preparation. Hungary has already submitted an LCDS update on the 13th April 2015. In the submitted template from 9th January 2015 as well as in the update it is mentioned, that the LCDS will be a part of the second National Climate Change Strategy.

2017: Hungary informed that part of the Second National Climate Change Strategy (NCCS II) the Low Carbon Development Strategy was submitted to the government in 2015. After review and public consultation the NCCS II was approved by the government in 2017.

2018: no update submitted

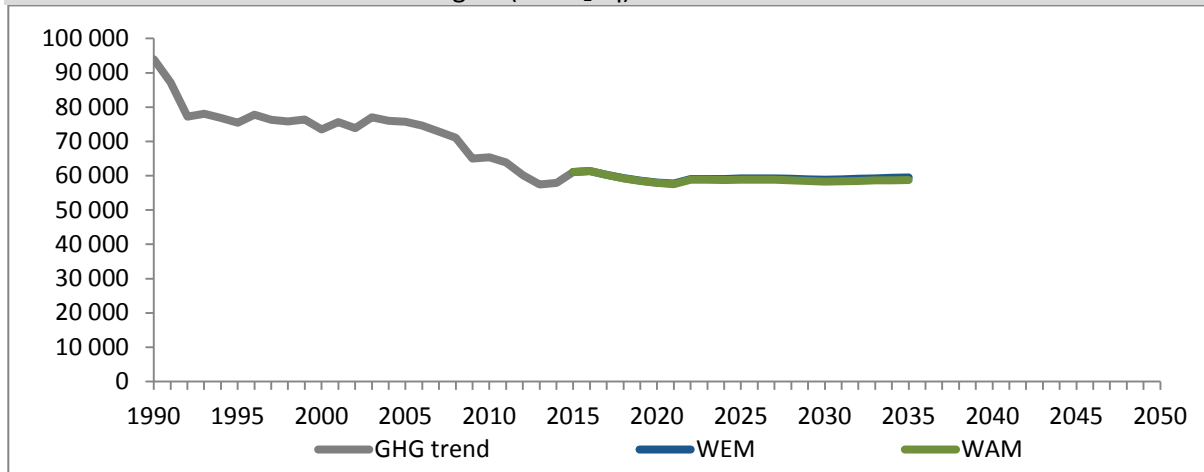
Long-term vision of the MS

Hungary informed that the LCDS has a timeframe of 2017 to 2030, with an outlook until 2050. Information on long-term targets is not available.

Key policies and measures of the strategy

As the NCC II is not published, information on this topic cannot be provided.

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, WAM - projections with additional measures, no LCDS target reported
Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Hungary elaborated a second National Climate Change Strategy with a focus on 2017-2030, but did not submit it to fulfil the reporting requirement of Low Carbon Strategies. In the case that Hungary is also intending to meet the 2050 GHG reduction target of -80-95 %, a significant decrease in GHG emissions will be necessary.

4.14 LCDS Summary for Ireland

Name of LCDS and status

2015: Ireland submitted the template on 7th February 2015, but their LCDS “National Mitigation Plan to 2050” is still in preparation. The Climate Action and Low-Carbon Development Bill, due for enactment early in 2015, gives 12 months for the submission of the National Mitigation Plan to the government. This plan will be updated at least every 5 years. The [Report on the Outline Heads of the Climate Action and Low Carbon Development Bill](#) (2013) discusses what should be included in the National Mitigation Plan, and the [National Policy Position](#) (2014) on climate action and low-carbon development sets out the high-level objective for 2050. The [template](#) was updated on 3rd March 2015, to confirm that the bill is progressing through the legislative process.

2017: Ireland informed that the [Climate Action and Low Carbon Development Act 2015](#) was enacted. At the core of the 2015 Act is a statutory recognition of the ‘National transition objective’ – the goal of pursuing a low carbon, climate resilient and environmentally sustainable economy by 2050. To facilitate the achievement of the ‘transition objective’, the 2015 Act provides for the development and submission to Government for approval, successive National Mitigation Plans (NMPs).

In the meantime the first [National Mitigation Plan](#) was published in July 2017, laying the foundations for transitioning Ireland to a low carbon, climate resilient and environmentally sustainable economy by 2050.

2018: no update submitted

Long-term vision of the MS

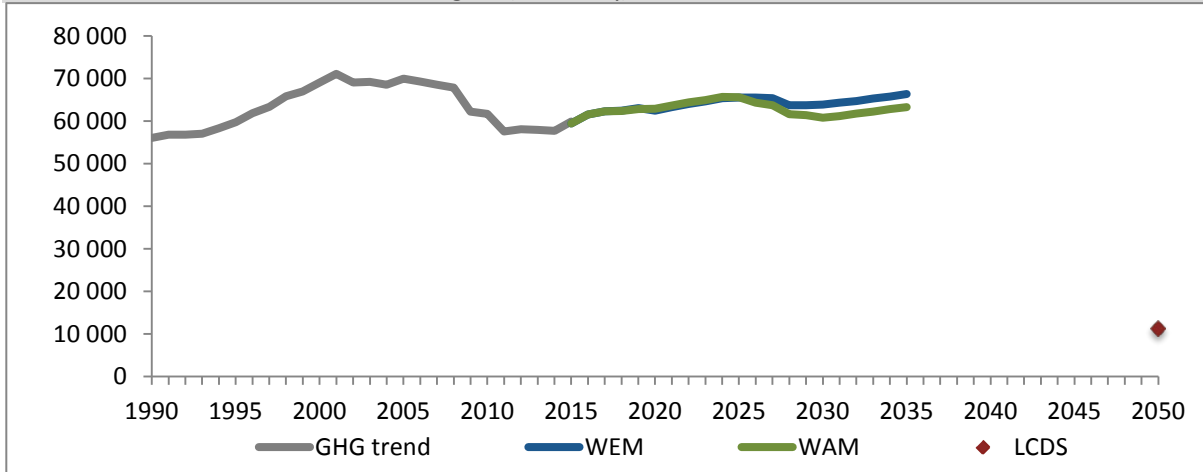
The Climate Action and Low-Carbon Development Bill created statutory obligations for successive five-yearly national mitigation plans, which will detail actions required to achieve the greenhouse gas mitigation obligations of the Irish State under EU and international law. The long-term goal will be a reduction of CO₂ emissions of 80% from 1990 by 2050 across electricity generation, built environment and transport sectors, and striving for carbon neutrality in agriculture and land-use sectors. The first National Mitigation Plan does not provide a complete roadmap to achieve the 2050 objective, but begins the process of development of medium to long-term mitigation choices for the next and future decades.

Key policies and measures of the strategy

The National Mitigation Plan details in total 106 mitigation measures in place and under consideration. Several actions are also dedicated to the overall climate policy framework, such as: evaluation of public expenditure, examination of impact of carbon tax and future tax rates, identifying fossil fuel subsidies. The sectoral actions are about the following subjects:

- Electricity Generation: bio energy, offshore energy, interconnection, upgrade of grids, spatial planning, energy storage, carbon capture and storage.
- Built environment: energy management, energy efficiency, fuel switching
- Transport: technology and behavioural change, electric vehicles and alternative fuels, taxation, public transport.
- Agriculture, forest and land use: land management, use of biomass, circular bioeconomy, afforestation, nutrient management, organic farming.

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, WAM - projections with additional measures, LCDS – Low Carbon Development Strategy’s objective

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Ireland is committed to tackle climate change through the Paris Agreement, and has the national objective to achieve a reduction of CO₂ emissions of at least 80% by 2050 (compared to 1990). Regarding the past emission trend and the projections for 2035, strong ambitions will be necessary to achieve the 2050 target.

It is recommended to submit an update relevant to low carbon strategies referring to the first National Mitigation Plan.

4.15 LCDS Summary for Italy

Name of LCDS and status

2015: Italy submitted the template and LCDS on the 18th February 2015, which is the 5th chapter of the [National Energy Strategy](#), which was adopted in March 2013.

2016, 2017, 2018: no update submitted

Long-term vision of the MS

The Italian LCDS is an energy strategy, and outlines various scenarios to support the progressive decarbonisation of the economy, to meet the target of reducing GHG emissions by 80 to 95% from 1990 levels by 2050. Six technological and market developments are highlighted in the LCDS that Italy could use in their long-term vision:

- Continuous development of renewable technologies, cost reduction and performance improvement;
- Development of smart grids and electric storage;
- Increased use of second and third generation biofuels;
- Development and commercialisation of CCS;
- Increased role of nuclear power (although this refers more to worldwide energy development rather than Italy);
- Reduced costs and increased dissemination of electric vehicles, particular in urban environments.

Three scenarios aligned with the European Energy Roadmap 2050 are outlined:

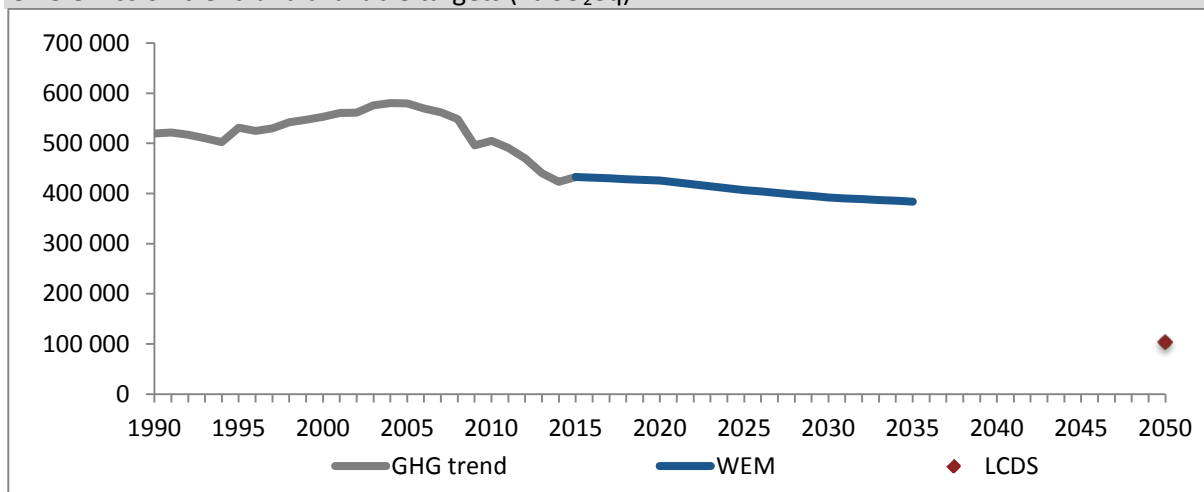
- High energy efficiency scenario – high renovation of existing buildings, stringent standards for new homes and new devices;
- High renewables development scenario - up to 85 to 90% of electricity sector, 60 to 65% of final energy consumption;
- Fast CCS deployment scenario – CCS is involved in 24% of electricity production in 2050.

Improvements in energy efficiency are needed in all scenarios, along with complete decoupling of economic growth with energy consumption. All scenarios have a target of 60% energy consumption originating from renewable energy by 2050.

Key policies and measures of the strategy

The Italian LCDS does not refer to any specific policies or measures.

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, LCDS – Low Carbon Development Strategy's objective

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Italy is committed to the EU long-term objective for 2050 of minus 80-95% GHG reduction by 2050 (compared to 1990). The strategy covers only the energy sector, and does not include specific policies or measures.

Regarding the past emission trend and the projections for 2035, further ambitions are necessary to meet the 2050 objective.

4.16 LCDS Summary for Latvia

Name of LCDS and status

2015: Latvia provided LCDS template and informed herein that the LCDS is currently under development.

2016, 2017, 2018: no update submitted

Long-term vision of the MS

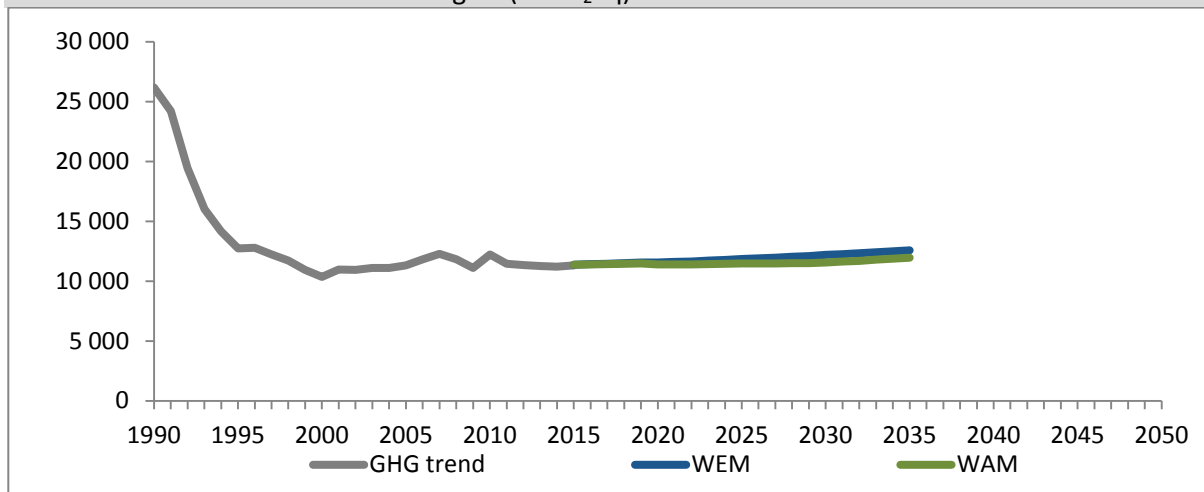
Latvia mentions several policy documents which consider low-carbon development, but none of these has a focus beyond 2030 and is considered a LCDS. The mentioned documents are: National Development Plan (NAP), Latvian Energy Strategy 2030, Environmental Policy Strategy 2014-2020, Science Priorities for 2014-2017.

A document named [Sustainable Development Strategy of Latvia until 2030](#) (prepared in 2010), not submitted, but available on the internet, sets general development objectives.

Key policies and measures of the strategy

The information provided in the template, does not contain any information on specific policies or measures.

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, WAM - projections with additional measures, no LCDS target reported
Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Latvia did not provide a low carbon development strategy until 2050. In case, Latvia supports also the EU long-term objective of minus 80-95% GHG emissions by 2050 (compared to 1990) further efforts are needed.

4.17 LCDS Summary for Lithuania

Name of LCDS and status

2015: Lithuania submitted the template, referring to the LCDS is named “National Strategy for Climate Change Management Policy by 2050” by 2050 and is a merger of several sectoral strategies and programmes.

2017: Lithuania informed about the adoption of the 2016 Action plan, containing updated measures for 2017-2019. In 2016 progress was achieved in implementing sectoral measures related to energy efficiency in transport, funding for transport system, building renovation, but also the forest area was expanded.

2018: no update submitted

Long-term vision of the MS

The LCDS is a synthesis of the following sectoral strategies and programmes, all contributing to the goal of achieving a 40% reduction by 2030, 60% by 2040 and 80% by 2050 (compared to 1990):

National Reform Programme (adopted in 2011), National Sustainable Development Strategy (adopted in 2003, revised in 2011), National Progress Programme (adopted in 2012), National Renewable Energy Resources Development Strategy (2010), National Energy Independence Strategy (2012), Long-term [until 2025] Strategy of the Lithuanian Transport System Development (2005), National Strategy Plan 2007-2013 Rural Development, National Forest Area Expansion Program 2012-2020 (2012), National Strategic Plan for Waste Management (2002), 2007-2012 Program for Preparation for Flood and Withdrawal of Flood Consequences in different counties.

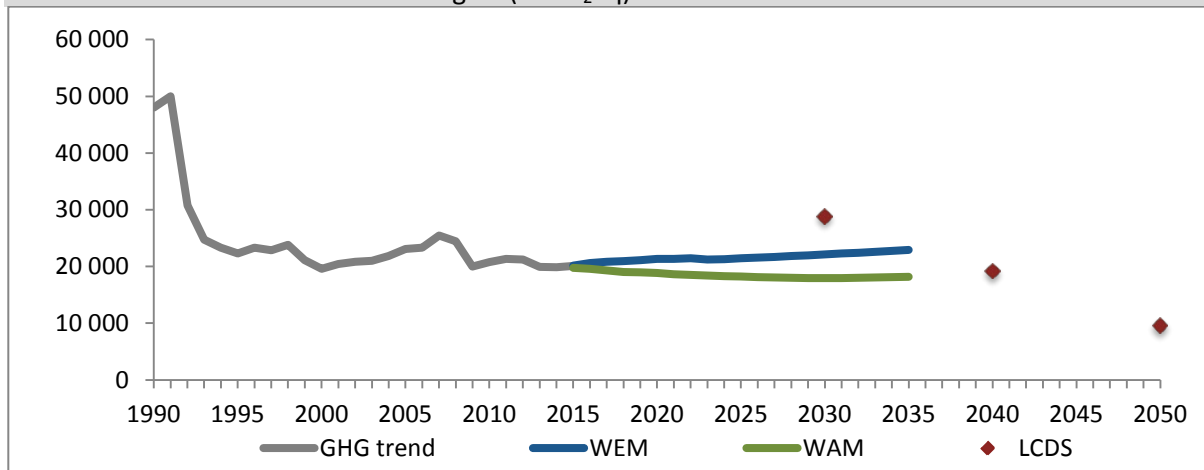
Lithuania’s LCDS focuses on the main aspects of climate change mitigation and adaptation. Due to the approach, that the strategy includes several sectoral strategies and programmes, just the main objectives are described.

The objectives of the LCDS will be realised by specified action plans with a short-term timeframe. In order to adjust the instruments properly, some of the action plans will be updated annually.

Key policies and measures of the strategy

The detailed policies and measures are to be found in the related sectoral strategies and plans. The submitted policies and measures under MMR Art.13 are part of these incorporated strategies. Two policies not reflected in the submission under MMR Art.13 are Carbon Capture and Storage and Nuclear Power.

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, WAM - projections with additional measures, LCDS – Low Carbon Development Strategy’s objective

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Lithuania is committed to the EU long-term objective of minus 80-95% GHG emission reduction by 2050 (compared to 1990), and has the national goal of achieving by 2030 a 40% reduction, by 2040 a 60% reduction and by 2050 a 80% reduction. The strategy is implemented by partly annual updated sector or topic specific action plans, and includes also adaptation.

Regarding the past emission and the projection until 2035, Lithuania expects to be well below its target for 2030, and is on track for its 2040 target. The achievement of the 2050 target, will require further efforts.

4.18 LCDS Summary for Luxembourg

Name of LCDS and status

2015: Luxembourg submitted the template on their LCDS on 15th July 2015, announcing that work on the LCDS is underway and that it is planned to produce an LCDS in 2016.

2016, 2017, 2018: no update submitted

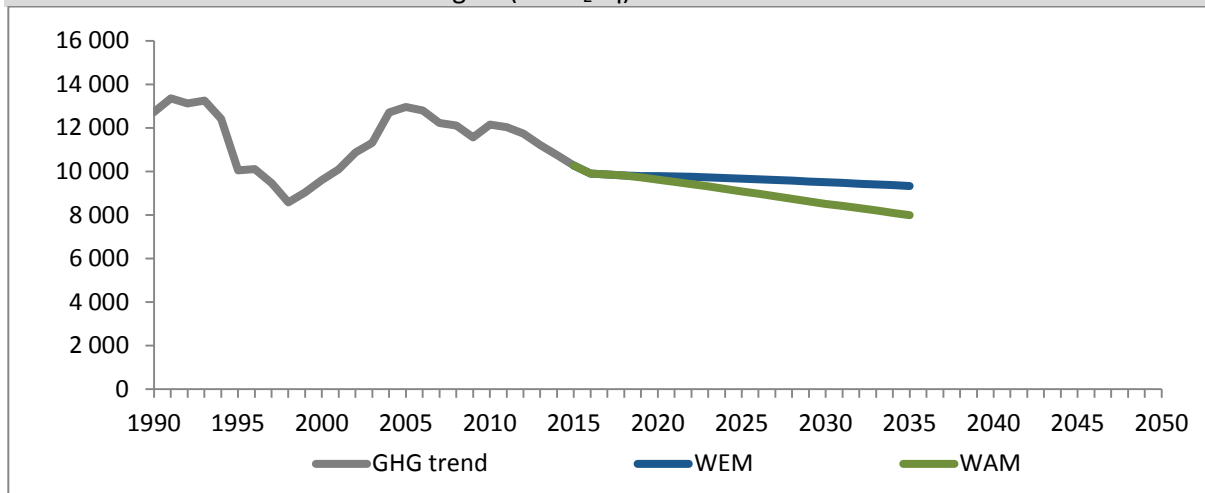
Long-term vision of the MS

Not applicable

Key policies and measures of the strategy

Not applicable

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, WAM - projections with additional measures, no LCDS target reported
Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Luxembourg did not submit a Low Carbon development strategy or any information about it.

In case, Luxembourg supports also the EU long-term objective of minus 80-95% GHG emissions by 2050 (compared to 1990) further efforts are needed.

4.19 LCDS Summary for Malta

Name of LCDS and status

2015: Malta submitted the template and the report [Malta's Report on the status of Implementation of Low-Carbon Development Policies and Strategies](#) specifically prepared for the reporting of LCDS. The report describes the current actions, and states that a LCDS is under preparation and its adoption is planned for the end of the year 20202020202020.

2016, 2017, 2018: no updates submitted

Long-term vision of the MS

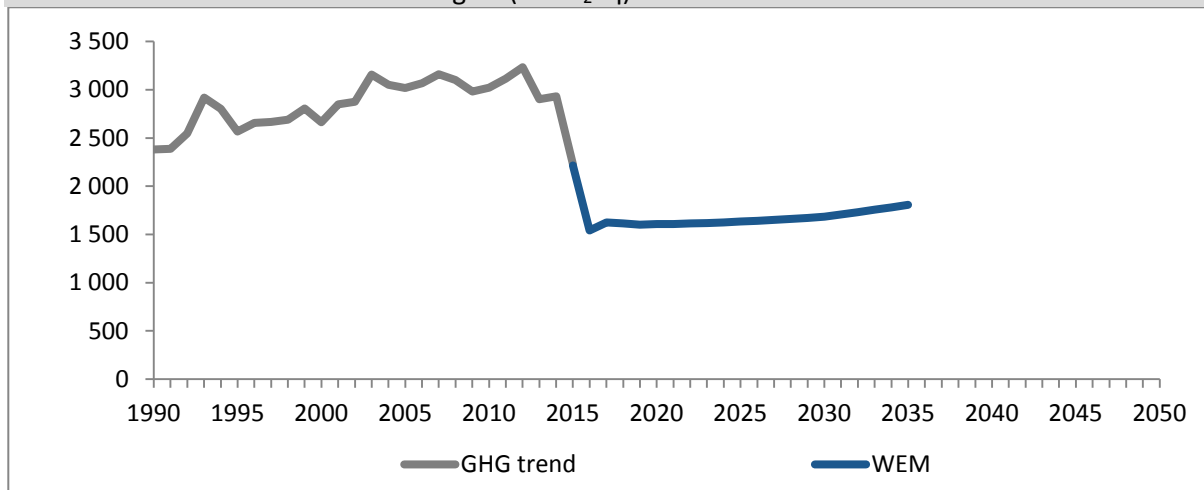
The report provided does not provide a long-term vision, as the LCDS is under preparation. As the key emission source in Malta is the energy sector, many measures are linked hereto. No specific targets are outlined.

Key policies and measures of the strategy

The following policies and measures are part of the Malta's report:

- Plant Load and Fuel Switching
- Installation of new efficient generating capacity
- Submarine electrical connection to European network
- Modal shift and electro-mobility

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, no LCDS target reported

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

The report prepared by Malta is well structured but only describes only the current status and provides has only a timeframe until 2020 – and not 2050. The description of institutional arrangements, implementation of measures, funding and involvement of stakeholders is very useful.

In case, Malta supports also the EU long-term objective of minus 80-95% GHG emissions by 2050 (compared to 1990) further efforts are needed.

4.20 LCDS Summary for Netherlands

Name of LCDS and status

2015: The Netherlands submitted the template and is referring to two documents:

- [Klimaatbrief 2050](#) - challenges for the Netherlands in achieving a competitive, climate neutral Europe, published in 2011
- [Exploration of pathways towards a clean economy by 2050: How to realise a climate-neutral Netherlands](#) (2011)

2017: The information provided by the Netherlands in 2017 refers to progress made since 2015, and mentions several actions which have been implemented. One of them is the [Energy Agenda 2016](#), which fleshes out into transition roadmaps covering the period until 2050 and action for individual energy functions covering the period until 2030. Additional to this a National Climate Adaptation Strategy and a government-wide circular economy programme have been elaborated in 2016.

2018: no update submitted

Long-term vision of the MS

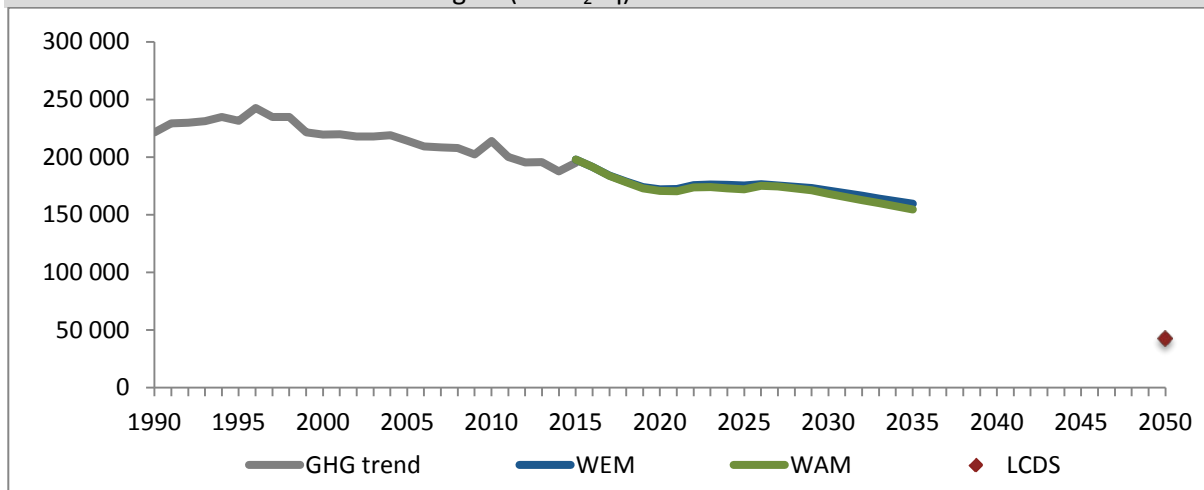
The LCDS of the Netherlands explores a climate neutral economy, which is translated as a domestic emission reduction of 80% by 2050. In the Climate Letter, it is specified that this target corresponds with an emission level of 40-45 Mt CO₂-eq in 2050. To achieve this target four pillars are essential:

- a CO₂-neutral electricity supply in combination with a larger role of electricity;
- use of sustainable biomass;
- energy saving, in particular by improving energy efficiency;
- CO₂ capture and storage (CCS)

Key policies and measures of the strategy

As the provided documents describe pathways towards a clean economy by 2050 concrete policies and measures are not included. It analyses dependencies, impacts, importance of specific technologies, and important steps in learning and implementation of the pathways.

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, WAM - projections with additional measures, LCDS – Low Carbon Development Strategy's objective

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

The Dutch Climate Letter is based on existing analysis and roadmaps, and summarises possible scenarios to achieve climate neutrality, whereby the implementation of innovative technologies, suitable funding mechanisms, choice of instruments, cost distribution, new public–private partnerships, the scope for public initiatives and making use of new market opportunities will play an important role.

Relating to the past emission trend and the projections until 2035, additional efforts will be necessary to achieve an emission level of 42.5 Mt CO₂ equivalents by 2050.

4.21 LCDS Summary for Poland

Name of LCDS and status

2015: Poland planned to prepare a low-carbon development programme, but the work on it, has been suspended. Currently some actions started to establish an inter-ministerial team for 'low-carbon transformation', which among others will aim to develop a low-carbon strategy to 2030. A timeframe for the preparation of a LCDS can currently be not provided.

2016, 2017, 2018: no update submitted

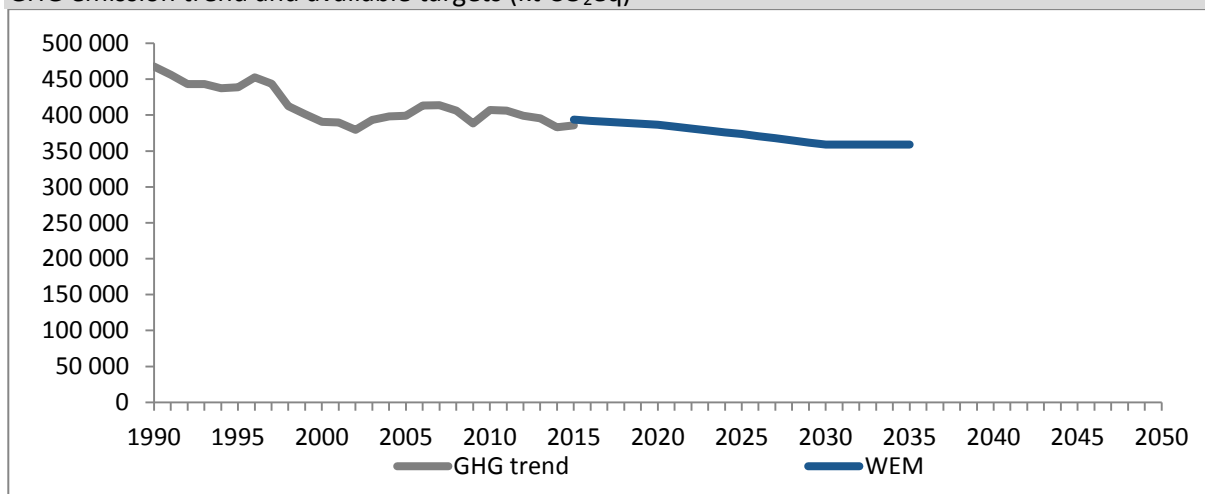
Long-term vision of the MS

Not applicable

Key policies and measures of the strategy

Not applicable

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, no LCDS target reported

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Poland has not submitted information on a Low Carbon Development Strategy for 2050, therefore no assessment is carried out. In case that Poland intends to support the EU long-term objective of GHG reduction by 80-95% until 2050, further efforts are needed.

4.22 LCDS Summary for Portugal

Name of LCDS and status

2015: Portugal's LCDS was initially published in 2012 as a result of a Ministerial decision in 2010. The so-called "[Roteiro Nacional de Baixo Carbono 2050](#)" (RNBC) has been inspired by the EU Roadmap towards a low carbon economy in 2050 in order to identify economically and technically feasible trajectories to a low-carbon economy in 2050 for Portugal. The RNBC has not been formally approved by the government and therefore it has no legal status. However, it currently stands as an overall long-term guidance document for climate policy. The submitted document is a feasibility study explaining different scenarios, showing potential strategic directions. In the LCDS report it is not mentioned if and when Portugal plans to update the LCDS.

2016, 2017, 2018: no updates submitted

Long-term vision of the MS

As previously mentioned the main goal of the RNBC is to study the technical and economic viability of greenhouse gas emission reduction pathways up to 2050 and its consistency with EU overall objectives. The study analyses the possible emission reduction contributions for all sectors including LULUCF, resulting in an emission reduction potential ranging between -50% and -60% (compared to 1990) by 2050.

Although, the LCDS of Portugal can rather be classified as a feasibility study than a strategy, there are elements described which have a "strategic" character. The main focus of the two (high and low) scenarios analysed lies on the energy sector (including transport) which is expected to provide the mayor contributions to the emission reductions. Within this context two sub-scenarios were tested for the high and low scenario: One sub-scenario assuming a 60% reduction of emissions in the energy sector and the second sub-scenario assuming a reduction of 70%.

The main drivers of the transformation of the energy sector of all scenarios are the increased use of wind power, hydro power, PV, CHP as well as the use of CCS technologies.

The RNBC does not mention interim targets for certain technologies or sectors, but all sectors (including LULUCF) have been considered.

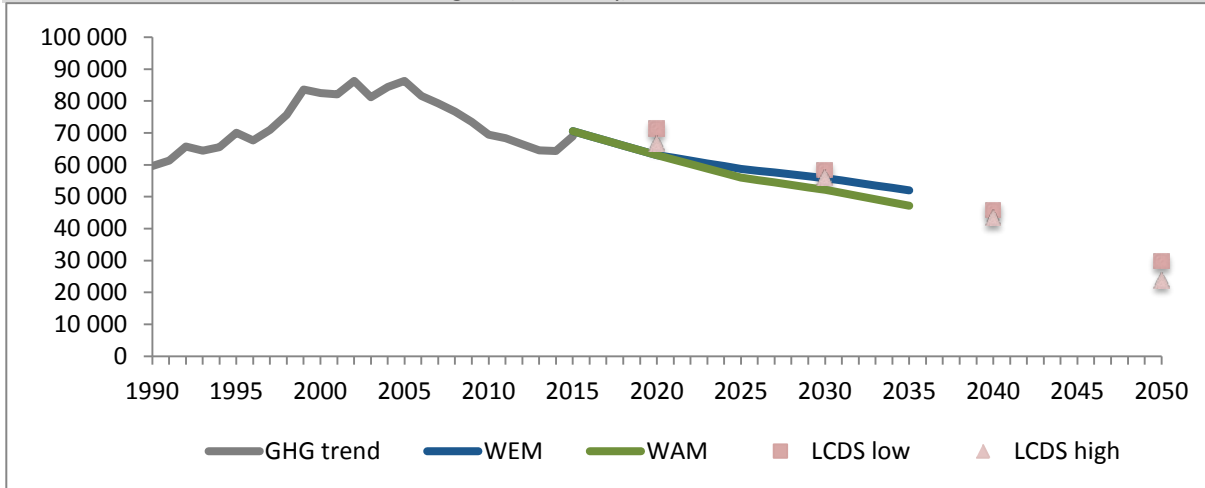
Key policies and measures of the strategy

In the LCDS report Portugal mentions that a revised climate change policy framework is currently under preparation. Moreover, the National Climate Change Programme will be revised and a Green Growth Strategy is under public consultation – both having targets for 2030.

In the submitted scenario document some key policies and measures are mentioned, however it also refers to strategies, plans and measures in Portugal, such as:

- Portuguese carbon fund (O fundo português de carbon)
- National strategy on climate change (estratégia nacional as alterações climaticas)
- Energy strategy (Estratégia para a Energia)
- National programme for climate change for the period 2013-2020 (PNAC 2020)
- Sectoral low carbon plans (planos sectorais de baixo carbono).

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, WAM - projections with additional measures, LCDS low and high – Low Carbon Development Strategy's objectives

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

The RNBC study provides a very comprehensive analysis, including a detailed description of all sectors, co-benefits as well as an economic analysis. The RNBC study shows ambitious targets, and reflects the targets of the EU low-carbon roadmap, but it is not adopted. It could be a good basis to formulate concrete targets and define actions.

The national ambition is lower than the EU commitment (minus 80-95% by 2050), and based on the past trend and projected emissions Portugal seems on track to achieve its national goal(s).

4.23 LCDS Summary for Romania

Name of LCDS and status

2015: Romania reported on the 9th January 2015. The report submitted as LCDS is [Romania's national strategy on climate change 2013 – 2020](#), dated 2013. This strategy contains a mitigation part, describing mitigation measures by sector, and an adaptation part, describing national and sectoral adaptation measures.

2016: Romania informed that no substantial changes to the information reported in 2016 occurred.

2017: Romania informed that [National Climate Change Strategy](#) was updated and complemented with a [National Action Plan](#) for the implementation of the Climate Change strategy: Both documents have been adopted by the government in 2016, now covering the period until 2030 and drawing a roadmap for 2050.

2018: no update submitted

Long-term vision of the MS

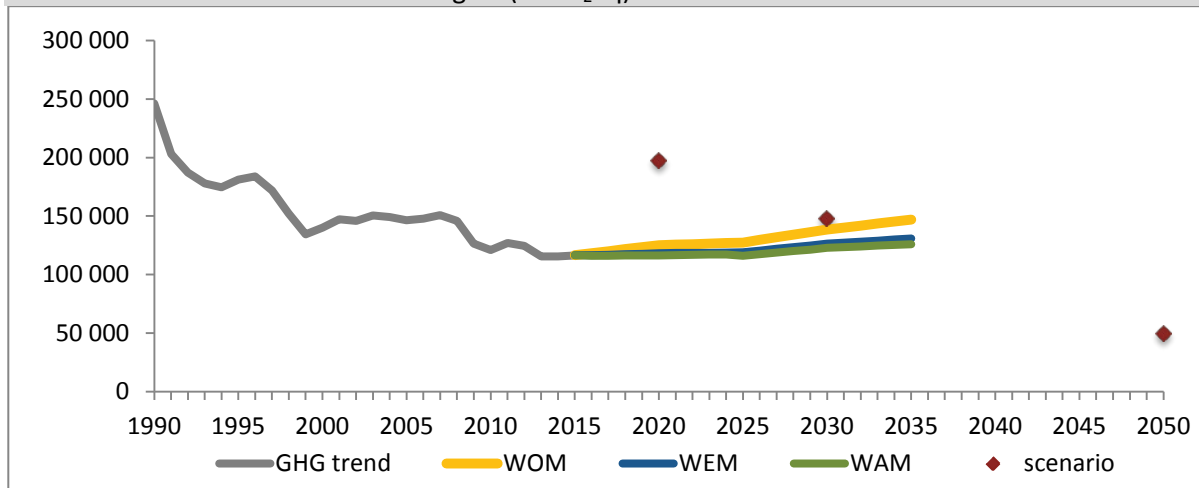
The strategy analyses three scenarios: reference scenario (-20% by 2020), green scenario (-40% by 2030) and super green scenario (-80% by 2050), whereby all sectors including LULUCF have been addressed. It is not clearly mentioned if the scenario for 2050 can be seen as national target to be achieved. The action plan only covers measures between 2016 and 2020.

Key policies and measures of the strategy

The key action areas of the strategy can be summarized as follows:

- Energy: efficiency measures in supply, conversion, transport and consumption
- Transport: promote climate-friendly transport, increasing urban transport efficiency
- Forestry: better carbon management
- Agriculture: low level of fertilizer use, emphasize agro-low-carbon practices

GHG emission trend and available targets (kt CO₂eq)



Note: WOM - projections without measures, WEM - projections with (existing) measures, WAM - projections with additional measures, LCDS – Low Carbon Development Strategy's objective based on national scenarios

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

The strategy is well structured and covers all sectors (incl. removals of GHGs by sinks), but cannot be regarded as a low carbon development strategy as it only refers to scenarios, and the action plan only covers measures until 2020.

If the 2050 scenario with a reduction of 80% is seen as a national target, then further ambitions are necessary.

4.24 LCDS Summary for Slovakia

Name of LCDS and status

2015: Slovakia submitted the reporting template and a “[Background document for preparation of Low Carbon Development Strategy](#)”. Slovakia planned to prepare a LCDS, but there was no information when it will be available and made public. Along with preparing updates of PaMs and projections of GHG emissions up to 2030 and based on governmental resolution Slovakia planned to intensify the process of preparation of the LCDS up to 2030 in co-operation with relevant ministries and in close co-operation with reputable international institutions.

2017: Slovakia informed that it is currently working on a low carbon development strategy in close cooperation with the World Bank. An agreement therefore was signed in 2016.

2018: no update submitted

Long-term vision of the MS

Slovakia defines the main goals and objectives of the future LCDS in three pillars:

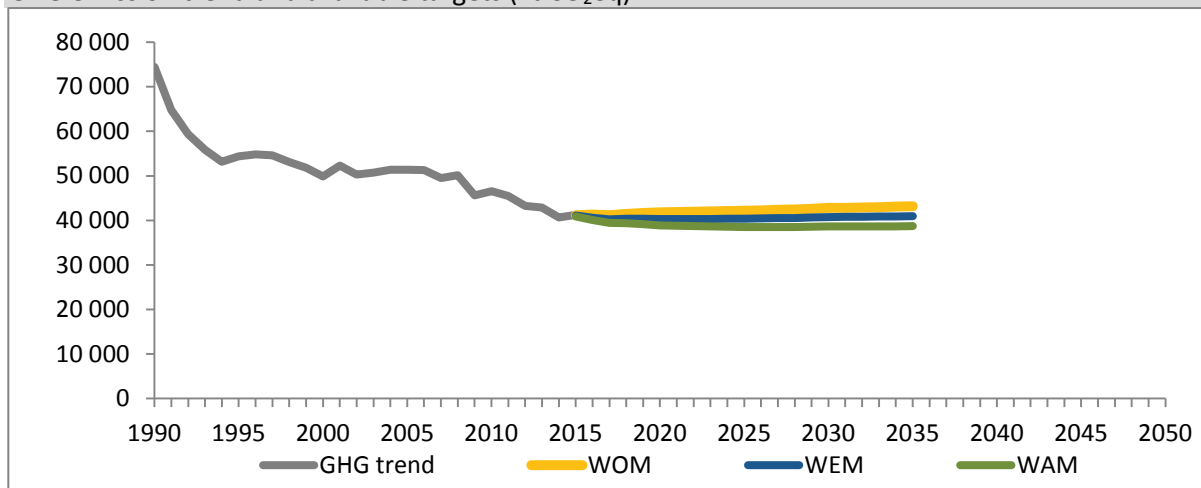
- policies and measures to reduce greenhouse gas emissions in energy and industry sectors;
- incentive and financing mechanisms for businesses to develop and implement green technologies and products;
- programmes, incentives and information tools to increase public awareness and higher demand for green products.

Key policies and measures of the strategy

The following policy areas are mentioned in the submitted background document:

- Research and employment of clean technologies in all sectors
- Nuclear power and renewable energy to decarbonize its electricity production.
- Diversification of energy sources and transport routes
- Improve energy efficiency, especially in the transport and building sectors (district heating)

GHG emission trend and available targets (kt CO₂eq)



Note: WOM - projections without measures, WEM - projections with (existing) measures, WAM - projections with additional measures, no LCDS target reported

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

The LCDS of Slovakia is still under development. The information currently available provides an overview of Slovakian 2030 vision and possible instruments. As a strategy for a low carbon development until 2050 is not included, it is not considered as an LCDS. In case Slovakia intends to meet a reduction of minus 80% by 2050, additional efforts will be necessary.

4.25 LCDS Summary for Slovenia

Name of LCDS and status

2015: Slovenia submitted under the LCDS reporting requirement the report “Operational Programme of measures to reduce greenhouse gas emissions by 2020” in Slovene language (“[Operativni program ukrepov zmanjšanja emisij toplo-grednih plinov do leta 2020](#)”) that was adopted by the Slovene government in December 2014. In the context of the climate-energy legislative package, which was adopted end of 2008, Slovenia adopted new legally binding targets for reducing greenhouse gas emissions by 2020.

2016, 2017, 2018: no update submitted

Long-term vision of the MS

The Slovenian LCDS is a greenhouse gas emissions reduction concept until 2020, and can therefore not be considered a long-term strategy. Slovenia’s operational program for reducing greenhouse gas emissions by 2020 is implementing an action plan by which Slovenia will achieve its target of reducing greenhouse gas emissions pursuant to Decision 406/2008 / EC.

The key building blocks for the implementation of EU legislation in the field of climate policy by 2020 are the following action plans which have already been adopted by the government:

- Action Plan for Renewable Energy Sources for the period 2010-2020;
- Action Plan for Energy Efficiency for the Period 2008-2016 and
- Operational program for management of municipal waste, adopted in 2013.

The GHG reduction target of Slovenia until 2020 is that greenhouse gas emissions will not increase by more than 4% as compared to 2005 values, i.e. remain less than the value of 12 117 kt CO₂eq.

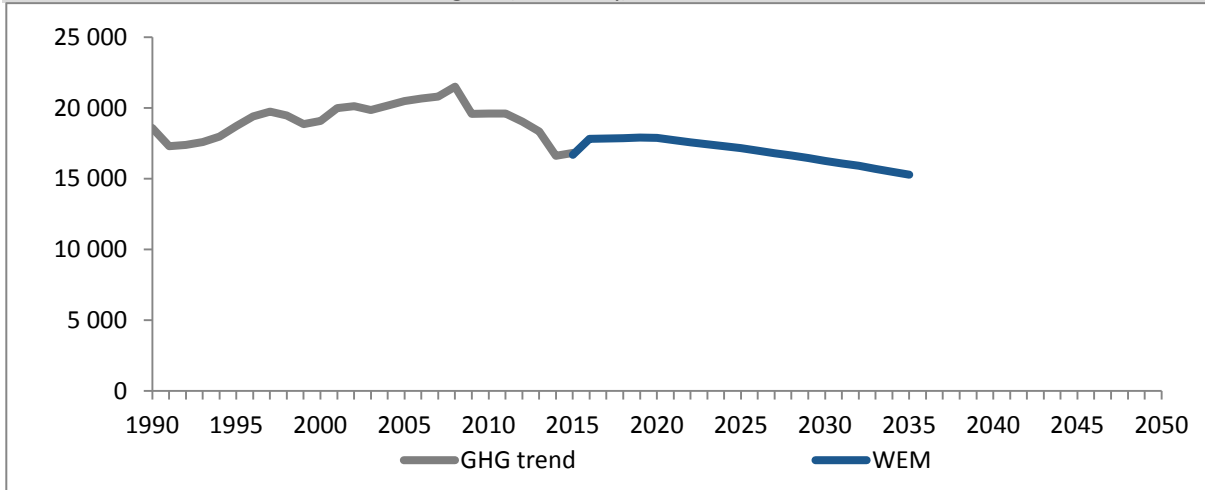
Key policies and measures of the strategy

The list of programs and measures is succinctly in the report, including the respective responsibilities. Slovenia’s core principles in climate change mitigation are transition to a competitive low-carbon economy, use of best available techniques, cost effectiveness and internalisation of external costs, creation of markets for greener products and technologies, and full implementation of EU’s climate and energy policies.

A list of specific policies and measures is presented in the report, whereby the following ones, are assumed to be key policies.

- OR-2 The gradual reduction in subsidies for fossil fuels
- OS-1 & OP-7 Energy efficiency in the context of sustainable spatial planning
- OS-5 & OI-3 Support scheme for electricity production from RES and high-efficiency CHP
- OS-4 Support schemes for the production of heat from renewable sources
- OR-3 & CE-1 Revision of environmental charges for waste disposal
- OP-9 Promoting the efficiency of vehicles within the tax for motor vehicles
- OS-2 Promoting EE and RES in buildings
- NS-1 Changes and amendments to regulations for energy efficiency in buildings
- NS-2a Schemes round funding for energy efficiency in households
- NS-2b Schemes round funding for energy efficiency in the public sector
- NA-3 Non-refundable financial incentives for sustainable mobility

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, no LCDS target reported

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

As the submitted document only refers to 2020, it is not considered a Low Carbon Development Strategy, although sectoral indicative targets for 2030 and 2050 are provided. The idea of “green growth” as a more holistic approach is already considered, but a clear focus on long-term development (i.e. 2050) is missing.

In the case that Slovenia intends to meet a reduction of 80-95% by 2050, further efforts are necessary.

4.26 LCDS Summary for Spain

Name of LCDS and status

2015: Spain submitted the template and LCDS “[Estrategia Española De Cambio Climático Y Energía Limpia](#)” (2007) on the 8th January 2015. The template includes a (broken) link to Spain’s [6th National Communication](#) (2013) which includes some progress updates, but a full updated LCDS is in progress.

2017: The information provided in 2017 mentions an update of the roadmap. It also says that first steps are being taken to prepare a Law on Climate Change and Energy Transition, which could be ready in 2018.

2018: no update submitted

Long-term vision of the MS

The Spanish LCDS extends only to 2020, and therefore cannot be considered a long-term vision. Most of the objectives covered in the LCDS are qualitative, but the energy sector has some quantitative targets for 2020:

- 10% biofuel contribution to transport energy consumption
- 37% renewable energy contribution to total electricity consumption
- 20% renewable energy contribution to total energy consumption
- 20% increase in energy efficiency

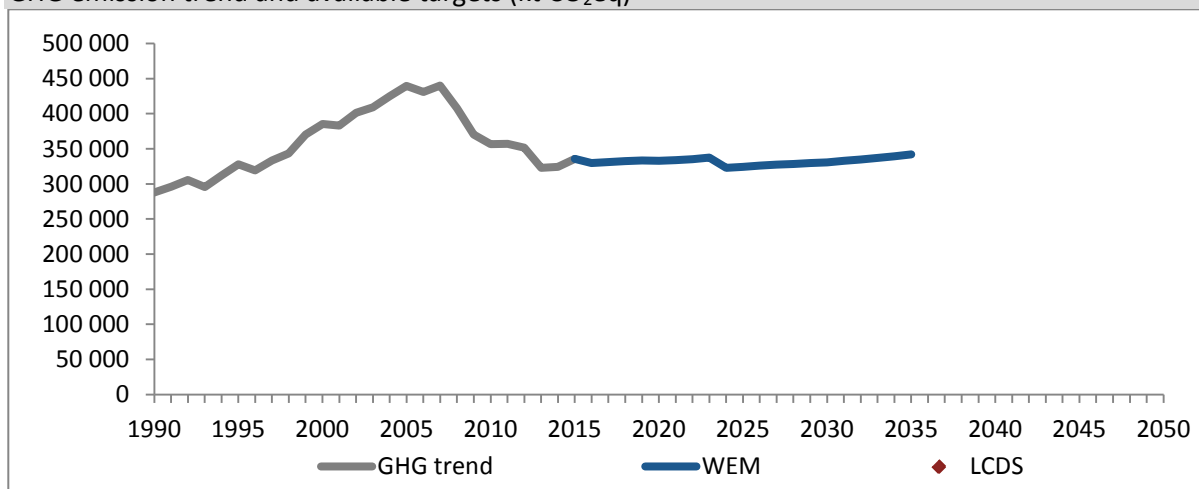
There is no 2020 GHG target in the LCDS, as it focuses on the immediate years after publication, 2008-2012, which had a target of not increasing GHG emissions by more than 37% from 1990.

Key policies and measures of the strategy

Few long-term policies and measures are contained within the Spanish LCDS. The LCDS lists the policies and measures which are part of the Plan of Urgent Measures, covering 2008-2012, and the CO₂ emissions avoided. Key PAMs for Spain’s LCDS include:

- Technical Building Code
- Renewable Energy Plan
- Energy Saving and Efficiency Plan
- Strategic Transport Infrastructure Plan (Plan estratégico de infraestructuras del transporte, PEIT)
- Integrated Waste National Plan
- Integrated Prevention and Pollution Control
- EU ETS

GHG emission trend and available targets (kt CO₂eq)



Note: WEM - projections with (existing) measures, no LCDS target reported

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

Spain has not prepared a long-term carbon strategy defining its goal for 2050 and policies or strategies how this will be achieved. The current information stems from 2007 and refers only to 2020. Regarding the past emission trend and the projection additional efforts are necessary to achieve a substantial reduction of GHG emission by 2050

4.27 LCDS Summary for Sweden

Name of LCDS and status

2015: Sweden has submitted a letter containing information on the status of implementation of a low-carbon development strategy (LCDS) as well as relevant updates to such a strategy and progress in implementing it. Sweden states in the submitted letter, that the preparation of the LCDS is still underway.

In April 2014, the Government appointed a Committee to develop a strategy for implementing the vision of zero net emissions in 2050. The results should have been published on February 15th 2016.

The preparation of the strategy with instruments and measures for a comprehensive and long-term climate policy was prolonged by June 1st, 2016.

As of June 27th 2016, a proposal of the climate change plan until 2050 is under consultation.

2016: no update submitted

2017: Sweden has reported that a national LCDS has not yet been adopted

2018: no update submitted

Note: Sweden is developing a LCDS to be submitted to the UNFCCC in 2018.

Long-term vision of the MS

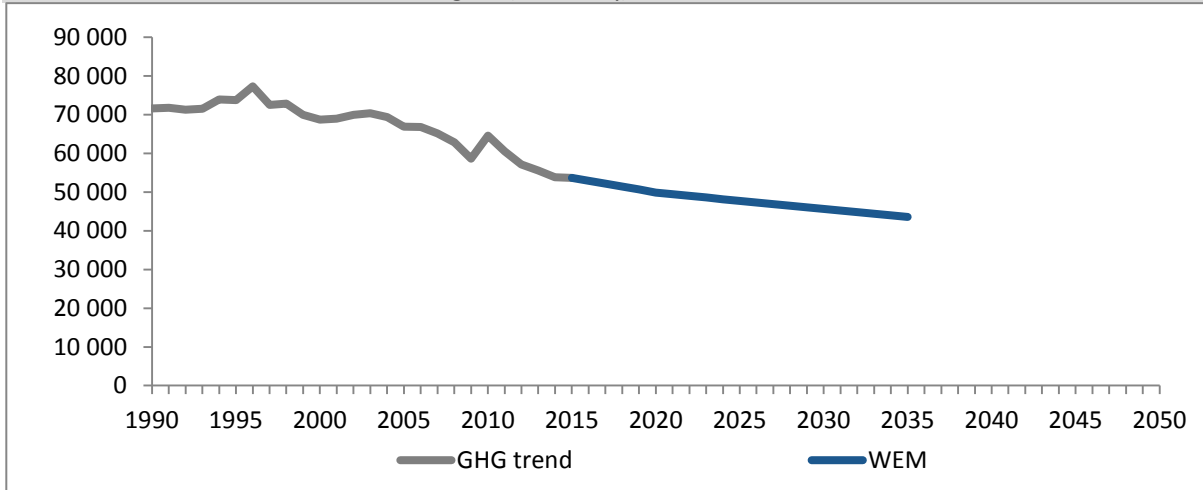
In 2010, the Swedish Parliament adopted the vision that, by 2050, net emissions of greenhouse gases should be zero. Furthermore, Sweden wants to keep a leading role within the EU and contribute to that the EU as a whole can reach the objective of reducing emissions by 80-95 %.

Key policies and measures of the strategy

As part of the process of developing a LCDS the Swedish Environmental Protection Agency, together with several other agencies, reported, in the so called "fardplan2050", to the government, the basis for a roadmap for zero net emissions in 2050. If the points described there will find their way into the final strategy is yet to be known. In any case it entailed:

- sharply reduced emissions
- increased carbon uptake
- possibly also buying allowances in other countries
- investment in research and innovation
- focus on infrastructure investments
- a transport-efficient society
- to conserve energy and resources
- to question consumption patterns

GHG emission trend and available targets (kt CO₂eq)



Note: WOM - projections without measures, WEM - projections with (existing) measures, envisaged target is zero net emission by 2050

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

The LCDS of Sweden is still under preparation. Nevertheless, the Swedish Parliament already adopted in 2010 the vision that, by 2050, net emissions of greenhouse gases should be zero. The reports by the Swedish Environmental Protection Agency, together with several other agencies, which emerged during the ongoing process of creating a LCDS suggest a broad approach affecting all sectors as well as consumption patterns.

In the case that Sweden intends to meet a GHG reduction of 80-95% by 2050, further efforts are needed.

4.28 LCDS Summary for the United Kingdom

Name of LCDS and status

2015: The UK submitted the template and the LCDS [The Carbon Plan](#) (2011) on 29th December 2014, and [a LULUCF action report](#) on 9th January 2015. The latest [Government response to meeting the carbon budgets](#) (2014) was included in the template. The LCDS will be updated after the UK sets the fifth carbon budget in 2016.

2017: The UK passed its Fifth carbon Budget (covering 2028-2032) into law on 21 July 2016, as foreseen by the Climate Change Act 2008. Carbon budgets cap GHG emissions over successive five year periods and must be set 12 years in advance.

2018: The UK informed about the [Clean Growth Strategy](#), which sets out proposals for decarbonising all sector of the UK economy. This strategy has been presented to the Parliament in 2017 under the Climate Change Act 2008.

Long-term vision of the MS

The Clean Growth Strategy shall lead the way to a low carbon future. The Climate Change Act from 2008 committed the UK to reduce GHG emissions by at least 80% by 2050 (compared to 1990). This is ensured by legally binding carbon budgets, setting emission limits for 5-year terms. The third carbon budget covers 2018-2022 and foresees a GHG emission reduction of 37%. Carbon budgets are set until 2032 and leading to an anticipated reduction of 57% (according to the 5th Carbon budget).

The Clean Growth Strategy is now setting the frame to implement the Climate Change Act by identifying policies and measures, which contribute to meeting the domestic commitments at the lowest possible net cost to UK taxpayers, consumers and businesses and to maximise the social and economic benefits for the UK from this transition. This approach supports the national Industrial Strategy, by fostering low-carbon innovation, improving productivity and setting smart regulations. Extensive governmental investments are here fore provided. To secure future financing mechanisms a specific taskforce (Green Finance Taskforce) has been set up.

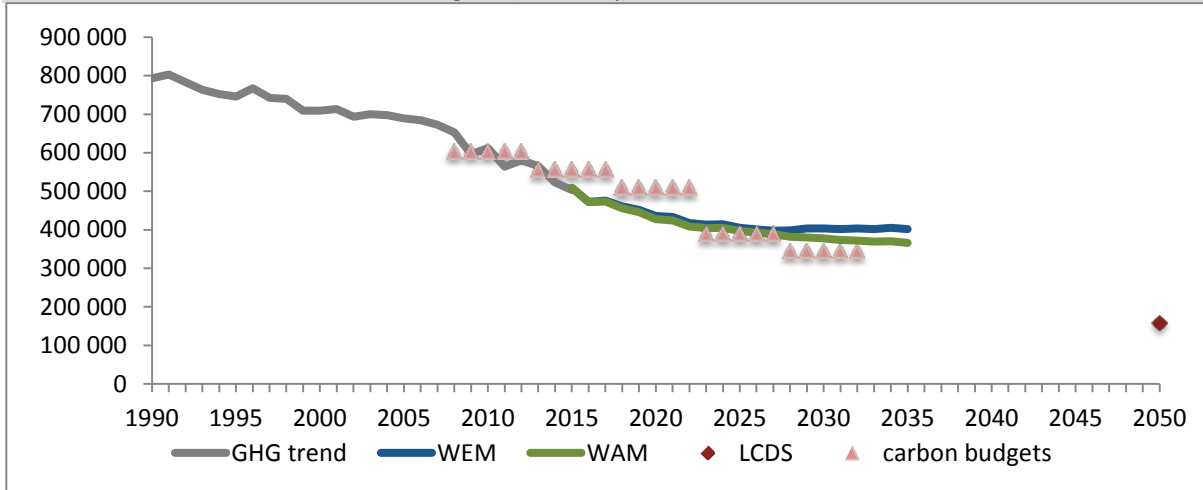
Progress in delivering increased economic growth and reduced emissions is monitored by an Emission Intensity Ration (EIR), and will be annually published.

Key policies and measures of the strategy

The following areas for key actions are part of the Clean Growth Strategy:

- Accelerating clean growth: develop world leading green finance capabilities
- Improving business and industry efficiency (– 25% of UK emissions)
- Improving the energy efficiency of our homes & Rolling out low carbon heating (-13% of UK emissions)
- Accelerating the shift to low carbon transport (– 24% of UK emissions)
- Delivering Clean, Smart, Flexible Power (– 21% of UK Emissions)
- Enhancing the benefits and value of our natural resources (– 15% of UK emissions)
- Leading in the public sector (– 2% of UK emissions)
- Government leadership in driving clean growth

GHG emission trend and available targets (kt CO₂eq)



Note: WOM - projections without measures, WEM - projections with (existing) measures, WAM - projections with additional measures, LCDS – Low Carbon Development Strategy’s objective

Sources: EEA, 2017a; EEA, 2017b; EEA, 2018.

Conclusion

The United Kingdom has implemented the Climate Change Act which sets carbon budgets for five year periods, and ensures thereby a continuous decline of GHG emissions. The legally binding target for 2050 is a GHG reduction at least by 80%, as set in the Climate Change Act. The Clean Growth Strategy from 2017 will support meeting the fourth and fifth carbon budget by simultaneously ensuring that the UK economy remains competitive. It brings economic, social and climate ambitions together, and sets a number of policies and measures.

Related to the emission projections, further efforts are needed to meet the fourth and fifth carbon budget, which are addressed in the Clean Growth Strategy.

Further Reading

There are projects that explore the Low Carbon Development Strategies:

- **'Climate Recon 2050: Dialogues on Pathways and Policy'** is a project that brings together policymakers from EU Member States, as well technical experts and climate modellers in two parallel dialogue fora with one overarching goal: exchanging experiences, knowledge and best practices on long-term climate strategies and decarbonisation scenarios that underpin such strategies. The objective of the project is to facilitate intra-EU exchange and foster the creation of tools, know-how and networks essential to develop effective and ambitious national long-term climate policy frameworks as a tool to guide a successful transition to a low-carbon economy.
More information: <http://climatedialogue.eu/>
- The **Deep Decarbonization Pathways Project (DDPP)** is a global collaboration of energy research teams charting practical pathways to deeply reducing greenhouse gas emissions in their own countries. It is predicated on taking seriously what is needed to limit global warming to 2°C or less. The initial results of this collaboration are reflected in reports on deep decarbonization pathways for Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan Mexico, Russia, South Africa, South Korea, United Kingdom and United States. In addition, the consortium developed cross-cutting analyses and open-source tools.
More information: <http://deepdecarbonization.org/>
- **MaxiMiseR - Ticking boxes, or marking success?** - Maximising the potential of the EU's Monitoring Mechanism Regulation. By strengthening processes around, and content of, EU Member States low-carbon development strategies, the LIFE-MaxiMiseR project aimed to enhance the capacity of European institutions and governments to improve their development and implementation. The ultimate goal was to use LCDs for transitioning to low-carbon economies.
More information: <http://www.maximiser.eu/about/>
- **2050 Pathways Platform** is a multi-stakeholder initiative launched at COP 22 to support countries seeking to develop long-term, net zero-GHG, climate-resilient and sustainable-development pathways. Designed as a space for collective problem-solving, the platform will also build a broader constellation of cities, states, and companies engaged in long-term low-emissions planning of their own, and in support of the national strategies.
More information: <https://www.2050pathways.org/>

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European Commission, 2016b. *2020 climate & energy package*, available at: http://ec.europa.eu/clima/policies/strategies/2020/index_en.htm, last accessed on 27 September 2018.

European Commission, 2016c. *2030 climate & energy framework*, available at: http://ec.europa.eu/clima/policies/strategies/2030/index_en.htm, last accessed on 27 September 2018.

European Commission, 2016d: *2050 low-carbon economy*, available at: http://ec.europa.eu/clima/policies/strategies/2050/index_en.htm, last accessed on 27 September 2018.

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Annex 1 – General framework for long-term strategies¹¹

1. Overview and process for developing the strategies
 - 1.1. Executive summary
 - 1.2. Legal and policy context
 - 1.3. Public consultation
2. Content
 - 2.1. Total greenhouse gas emissions reductions and enhancements of removals by sinks
 - 2.1.1. Projected emission reductions and enhancement of removals by 2050
 - 2.1.2. National target for 2030 and beyond, if available, and indicative milestones for 2040 and 2050
 - 2.1.3. Adaptation policies and measures
 - 2.2. Renewable energy
 - 2.2.1. To the extent feasible, the estimated likely share of renewable energy in final energy consumption by 2050
 - 2.3. Energy efficiency
 - 2.3.1. To the extent feasible, the estimated likely energy consumption by 2050
 - 2.4. Sector-specific related content
 - 2.4.1. Energy system
 - 2.4.1.1 Intended or likely future emissions trajectory or range
 - 2.4.1.2 General description of main drivers for energy efficiency, demand-side flexibility and energy consumption and their evolution from 2021 and beyond
 - 2.4.2. Industry
 - 2.4.2.1. Expected emissions reductions by sector and energy demands
 - 2.4.2.2. General overview of the policies, existing plans and measures for decarbonisation as described in point 2.1 of Section A of Part I of Annex I
 - 2.4.3. Transport
 - 2.4.3.1. Expected emissions and energy sources by transport type (e.g. cars and vans, heavy duty road transport, shipping, aviation, rail)
 - 2.4.3.2. Decarbonisation options
 - 2.4.4. Agriculture and land use, land-use change and forestry (LULUCF)
 - 2.4.4.1. To the extent feasible, expected emissions by sources and by individual greenhouse gases
 - 2.4.4.2. Emission reduction options envisaged
 - 2.4.4.3. Links to agricultural and rural development policies
3. Financing
 - 3.1. Estimates of investment needed
 - 3.2. Policies and measures for related research, development and innovation
4. Impact assessment of the socio-economic aspects
5. Annexes (as necessary)
 - 5.1. Details on modelling (including assumptions) and/or analysis, indicators etc.

¹¹ Source: Annex IV of the Proposal for a Regulation of the European Parliament and of the Council on the Governance of the Energy Union and Climate Action (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:PE_55_2018_INIT&from=EN)

Annex 2 – Links to national submissions

Member State	Link to submission on CDR	Date of Submission
Austria	http://cdr.eionet.europa.eu/at/eu/mmr/art04-13-14_lcds_pams_projections/envvk6l1a/AT-Bericht-LCDS.pdf	08 Jan 2015
Austria	https://cdr.eionet.europa.eu/at/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwmz6pq/AT_Art.13-1b-Update-LCDS-20170315.pdf	15 Mar 2017
Belgium	http://cdr.eionet.europa.eu/be/eu/mmr/art04-13-14_lcds_pams_projections/envvk5kbg/Template_LCDS-BE_goedgek_NKC_7-Jan-2015.pdf	08 Jan 2015
Belgium	http://cdr.eionet.europa.eu/be/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwfjvmw/Report_PAMs_Belgium_2017.pdf	27.03.2017
Bulgaria	http://cdr.eionet.europa.eu/bg/eu/mmr/art04-13-14_lcds_pams_projections/envvo_vka/Template_for_reporting_on_updates.doc/manage_document	09 Jan 2015
Bulgaria	http://cdr.eionet.europa.eu/bg/eu/mmr/art04-13-14_lcds_pams_projections/envvo_vka/Template_for_reporting_on_updates.doc	08.Jan 2016
Bulgaria	http://cdr.eionet.europa.eu/bg/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwmlqbq/Template_for_reporting_on_LCDS_BG.docx/manage_document	15.03.2017
Croatia	http://cdr.eionet.europa.eu/hr/eu/mmr/art04-13-14_lcds_pams_projections/envvladyg/Template_for_reporting_on_LCDS_-_1_Croatia.doc	09 Jan 2015
Cyprus	http://cdr.eionet.europa.eu/cy/eu/mmr/art04-13-14_lcds_pams_projections/envvqahkg/MMR_Art4.2_LCDS_status_of_implementation_CY_2015.pdf	16 Mar 2015
Cyprus	http://cdr.eionet.europa.eu/cy/eu/mmr/art04-13-14_lcds_pams_projections/projections/envvxcba/PROJ2016_Final_200416.pdf	20 Apr 2016
Cyprus	http://cdr.eionet.europa.eu/cy/eu/mmr/art04-13-14_lcds_pams_projections/projections/envwp8wwa/PROJ2017_250417.pdf	25 Apr 2017
Cyprus	http://cdr.eionet.europa.eu/cy/eu/mmr/art04-13-14_lcds_pams_projections/projections/envwooyq/PROJ2018.pdf	26 Feb 2018
Czech Republic	http://cdr.eionet.europa.eu/cz/eu/mmr/art04-13-14_lcds_pams_projections/colvk5nvq/envvk5nyq/CZE_Template_reporting_LCDS_January_2015.pdf	08 Jan 2015
Czech Republic	http://cdr.eionet.europa.eu/cz/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwmj1nq/CZE_template_LCDS_update_March_2017.pdf	10 Mar 2017
Czech Republic	http://cdr.eionet.europa.eu/cz/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwqgb8w/CZE_template_LCDS_update_April_2017.pdf	27 Apr 2017
Denmark	http://cdr.eionet.europa.eu/dk/eu/mmr/art04-13-14_lcds_pams_projections/envvbaada/TEMPLATE-Denmarks_LCDS_StatusReport-12January2015.pdf	12 Jan 2015
Denmark	http://cdr.eionet.europa.eu/dk/eu/mmr/art04-13-14_lcds_pams_projections/pams/envvyjguq/PAMsAndProjectionsIntermediateUpdate-27April2016.pdf	03 May 2016
Denmark	http://cdr.eionet.europa.eu/dk/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwnpgxq/Denmarks_2017-update-on_PAMs-Projections-LCDS-LULUCF_March2017.pdf	31 Mar 2017
Estonia	http://cdr.eionet.europa.eu/ee/eu/mmr/art04-13-14_lcds_pams_projections/colvk6cgg/envvk6dra/EE_Template_for_reporting_on_LCDS-2_January_2015.doc	08 Jan 2015
Estonia	http://cdr.eionet.europa.eu/ee/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwmas_q/Template_for_reporting_on_updates_EE.DOC	13 Mar 2017

Estonia	http://cdr.eionet.europa.eu/ee/eu/mmr/art04-13-14_lcds_pams_projections/colvk6cqq/envwt8vpq/Template_for_reporting_on_updates_EE2018.DOC	24 Apr 2018
Finland	http://cdr.eionet.europa.eu/fi/eu/mmr/art04-13-14_lcds_pams_projections/envvk6pog/Finland_LCDS_January_2015_Submission.pdf	08 Jan 2015
Finland	http://cdr.eionet.europa.eu/fi/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwmaa2q/Finland_updates_on_L_CDP_2017.pdf	15 Mar 2017
France	http://cdr.eionet.europa.eu/fr/eu/mmr/art04-13-14_lcds_pams_projections/envvlarow/150109_Rapportage_strategie_bas_carbone.doc	09 Apr 2015
France	http://cdr.eionet.europa.eu/fr/eu/mmr/art04-13-14_lcds_pams_projections/pams/colwosiqq/envwosjxq/170303_NAF_strategie_nationale_bas_carbone.pdf	05 Apr 2017
Germany	http://cdr.eionet.europa.eu/de/eu/mmr/art04-13-14_lcds_pams_projections/envvknhq/150108_Germany_reporting_on_LCDS_fin.doc	09 Jan 2015
Germany	http://cdr.eionet.europa.eu/de/eu/mmr/art04-13-14_lcds_pams_projections/envvknhq/170313_Reporting_on_LCDS_Germany.final.doc	13 Mar 2017
Greece	http://cdr.eionet.europa.eu/gr/eu/mmr/art04-13-14_lcds_pams_projections/envvl_ew/Template_for_reporting_on_LCDS_GR.doc	21 Jan 2015
Hungary	http://cdr.eionet.europa.eu/hu/eu/mmr/art04-13-14_lcds_pams_projections/envvkwpq/Template_for_reporting_on_L_CDS.pdf	09 Jan 2015
Hungary	http://cdr.eionet.europa.eu/hu/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwu0wjw/Low_Carbon_Development_Startegy_update_2017_report.doc	13 Apr 2015
Hungary	http://cdr.eionet.europa.eu/hu/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwu0wjw/Low_Carbon_Development_Startegy_update_2017_report.doc	23 Jun 2017
Ireland	http://cdr.eionet.europa.eu/ie/eu/mmr/art04-13-14_lcds_pams_projections/envvk1rca/2015.01.09_EU_MMR_regulation_Article_4_-_National_report_IE.pdf	07 Jan 2015 (Template) 09 Feb 2015 (LULUCF)
Ireland	http://cdr.eionet.europa.eu/ie/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwmlxmq/MMR_Update_Ireland_D.doc	15 Mar 2017
Italy	http://groupware.sinanet.isprambiente.it/reportnet/library/projected_emissions/reporting-greenhouse-gas-monitoring-mechanism-regulation-mmr-525-2013-1/delivery-2015/art.-4-low-carbon-development-strategy/template-reporting-lcds_it/download/1/Template%20for%20reporting%20on%20LCDS_IT.docx	18 Feb 2015
Latvia	http://cdr.eionet.europa.eu/lv/eu/mmr/art04-13-14_lcds_pams_projections/envvlzvva/LV_Reporting_template_on_LCDS_January_2015.pdf	14 Jan 2015
Latvia	http://cdr.eionet.europa.eu/lv/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwqhspw/LV_projections_and_PAMs_2017_Final_1_.pdf	
Lithuania	http://cdr.eionet.europa.eu/lt/eu/mmr/art04-13-14_lcds_pams_projections/envvkspg/Reporting_on_LCDS_pursuant_to_Art_4_2_MMR_and_Art_21_of_Impl_Req.docx	09 Jan 2015
Lithuania	http://cdr.eionet.europa.eu/lt/eu/mmr/art04-13-14_lcds_pams_projections/pams/envvk6uwq/LT_report_on_LCDS_updates_2017.doc	13 Mar 2017
Luxembourg	http://cdr.eionet.europa.eu/lu/eu/mmr/art04-13-14_lcds_pams_projections/colvlutxw/envvlamkq/LU_2015_LCDS_150731.pdf	31 Jul 2015
Malta	http://cdr.eionet.europa.eu/mt/eu/mmr/art04-13-14_lcds_pams_projections/envvnssdw/MMR_Article_4_-_Template_for_reporting_on_LCDS_Malta_2015_final.pdf	06 Feb 2015

Netherlands	http://cdr.eionet.europa.eu/nl/eu/mmr/art04-13-14_lcds_pams_projections/envvk6g4q/11	08 Jan 2015 13 Mar 2015
Netherlands	http://cdr.eionet.europa.eu/nl/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwlfpcq/NLD_reporting_on_update_LCDS_2017_03_15_final.pdf	15.03.2017
Poland	http://cdr.eionet.europa.eu/pl/eu/mmr/art04-13-14_lcds_pams_projections/envvqlpba/Report_on_updates_related_to_LCDS_under_Article_13_of_MMR.pdf	13 Mar 2015 15 Jan 2015
Portugal	http://cdr.eionet.europa.eu/pt/eu/mmr/art04-13-14_lcds_pams_projections/envvkpkvw/LCDS_Report_2014_PT.pdf	09 Jan 2015
Romania	http://cdr.eionet.europa.eu/ro/eu/mmr/art04-13-14_lcds_pams_projections/envvk_kjq/Report_on_status_of_implementation_of_LCDS-Art. 4 para. 2 in Regulation no. 525-2013-EU.pdf	09 Jan 2015
Romania	http://cdr.eionet.europa.eu/ro/eu/mmr/art04-13-14_lcds_pams_projections/pams/envvuhz7q/Information_on_any_significant_changes_pursuant_Art. 13.2_of_Reg. EU 525-2013 .doc	15 Mar 2016
Romania	http://cdr.eionet.europa.eu/ro/eu/mmr/art04-13-14_lcds_pams_projections/colwmlviq/envwmpjhg/Report_on_status_of_implementation_of_LCDS_and_LULUCF_actions.pdf	16 Mar 2017
Slovakia	http://cdr.eionet.europa.eu/sk/eu/mmr/art04-13-14_lcds_pams_projections/pams/envvltlna/Template_for_reporting_on_LCDS_-_Slovakia-January_2015.pdf	13 Jan 2015
Slovakia	http://cdr.eionet.europa.eu/sk/eu/mmr/art04-13-14_lcds_pams_projections/projections/envwmne1q/SVK_Report_LCDSupdate_PAMs_Projections_15_03_2017.pdf	15 Mar 2017
Slovenia	http://cdr.eionet.europa.eu/si/eu/mmr/art04-13-14_lcds_pams_projections/envvaefiw/Template_for_reporting_on_LCDS_SI.doc	16 Jul 2015
Spain	http://cdr.eionet.europa.eu/es/eu/mmr/art04-13-14_lcds_pams_projections/envvk7cha/Reporting_on_LCDS_Spain.pdf	08 Jan 2015
Sweden	http://cdr.eionet.europa.eu/se/eu/mmr/art04-13-14_lcds_pams_projections/envvlzsoq/SE_LCDS_reporting_MMR_525-2013_Art_4_2_and_13_1.doc	14 Jan 2015
United Kingdom	http://cdr.eionet.europa.eu/gb/eu/mmr/art04-13-14_lcds_pams_projections/envvkfmpa/Template_for_reporting_on_UK_LCDS.pdf	29 Dec 2014 09 Jan 2015
United Kingdom	http://cdr.eionet.europa.eu/gb/eu/mmr/art04-13-14_lcds_pams_projections/pams/envwmm6dg/UK_Low_Carbon_Development_Strategy_Update_20170315_Art.13.pdf	15 Mar 2017
United Kingdom	http://cdr.eionet.europa.eu/gb/eu/mmr/art04-13-14_lcds_pams_projections/pams/lcds/envwqphfw/UK_LCDS_update_March_2018.pdf	15 Mar 2018

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