Adapting the 2050 Pathways Calculator **to other regions**

19th of September 2012 – Beijing

CLIMACT

Adapting the 2050 Pathways Calculator **to other regions**

- Context and objectives of the Belgian low carbon studies
- Adapting the Low carbon 2050 Pathways model to another region
- Wallonia can reduce its emissions by 80 to 95% by 2050

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Context and objectives of the Belgian low carbon studies

Adapting the Low carbon 2050 Pathways model to another region

Wallonia can reduce its emissions by 80 to 95% by 2050

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Belgium, a small country in the heart of Europe

Many (EU) organizations analyze 2050 energy and climate scenarios

NOT EXHAUSTIVE

2050

DEPARTMENT OF ENERGY & CLIMATE CHANGE

2050 Pathways Analysis

KLIMAKOMMISSIONEN

DANISH COMMISSION ON CLIMATE CHANGE POLICY

COMMUNICATION DE LA COMMISSION
AU PARLEMENT EUROPÉEN, AU CONSEIL, AU COMITÉ ÉCONOMIQUE ET SOCIAL EUROPÉEN ET AU COMITÉ DES RÉGIONS

Feuille de route vers une économie compétitive à faible intensité de carbone à l'horizon 2050

WWF

ROADMAP 2050

European Climate Foundation

THE ENERGY REPORT
100% RENEWABLE ENERGY BY 2050

2011

eurelectric
ELECTRICITY FOR EUROPE

POWER CHOICES
PATHWAYS TO CARBON-NEUTRAL ELECTRICITY IN EUROPE BY 2050

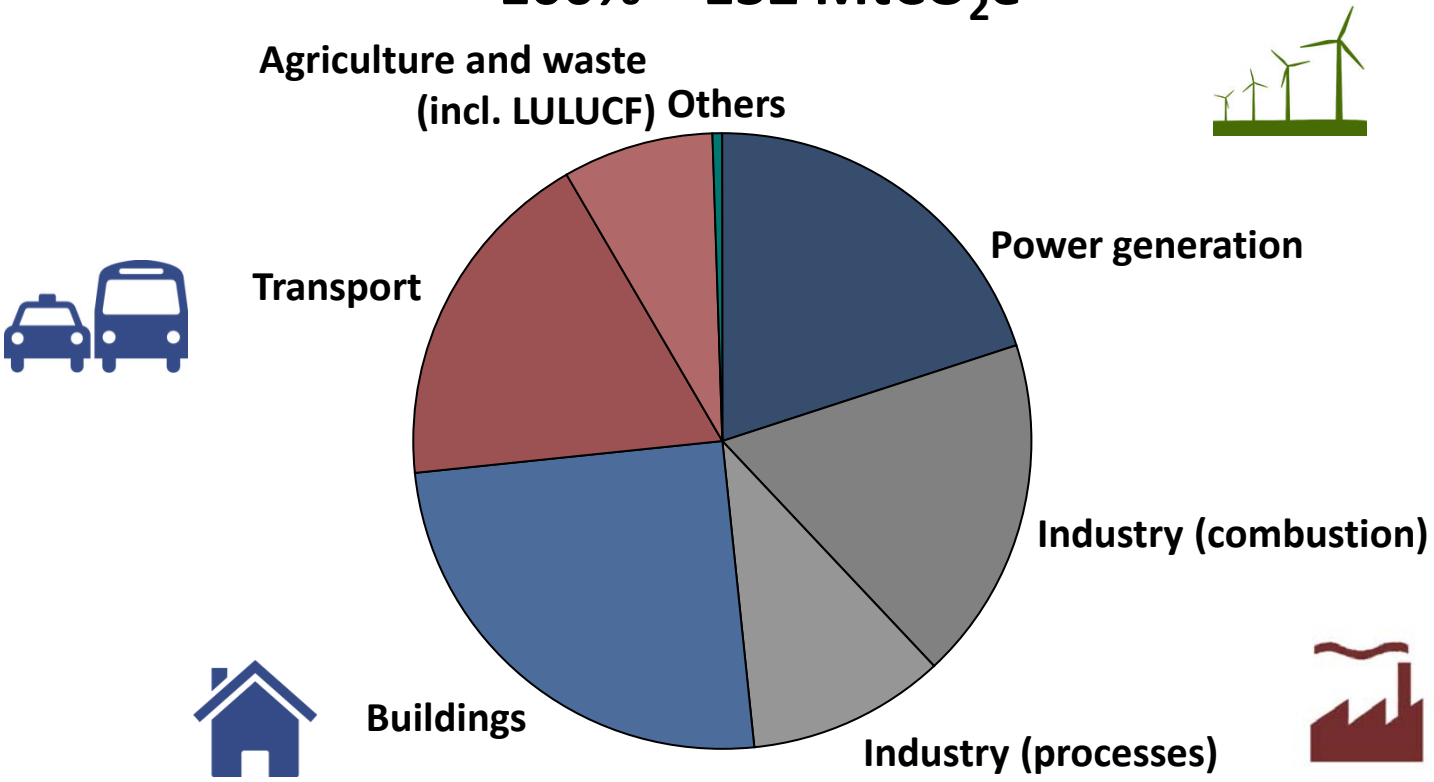
Trajectoires 2020 - 2050
vers une économie sobre en carbone

Source: Organizations' websites, Climact

Belgian emissions in 2010 are relatively equally distributed between power, industry, buildings and transport

GHG emissions in Belgium, 2010, %

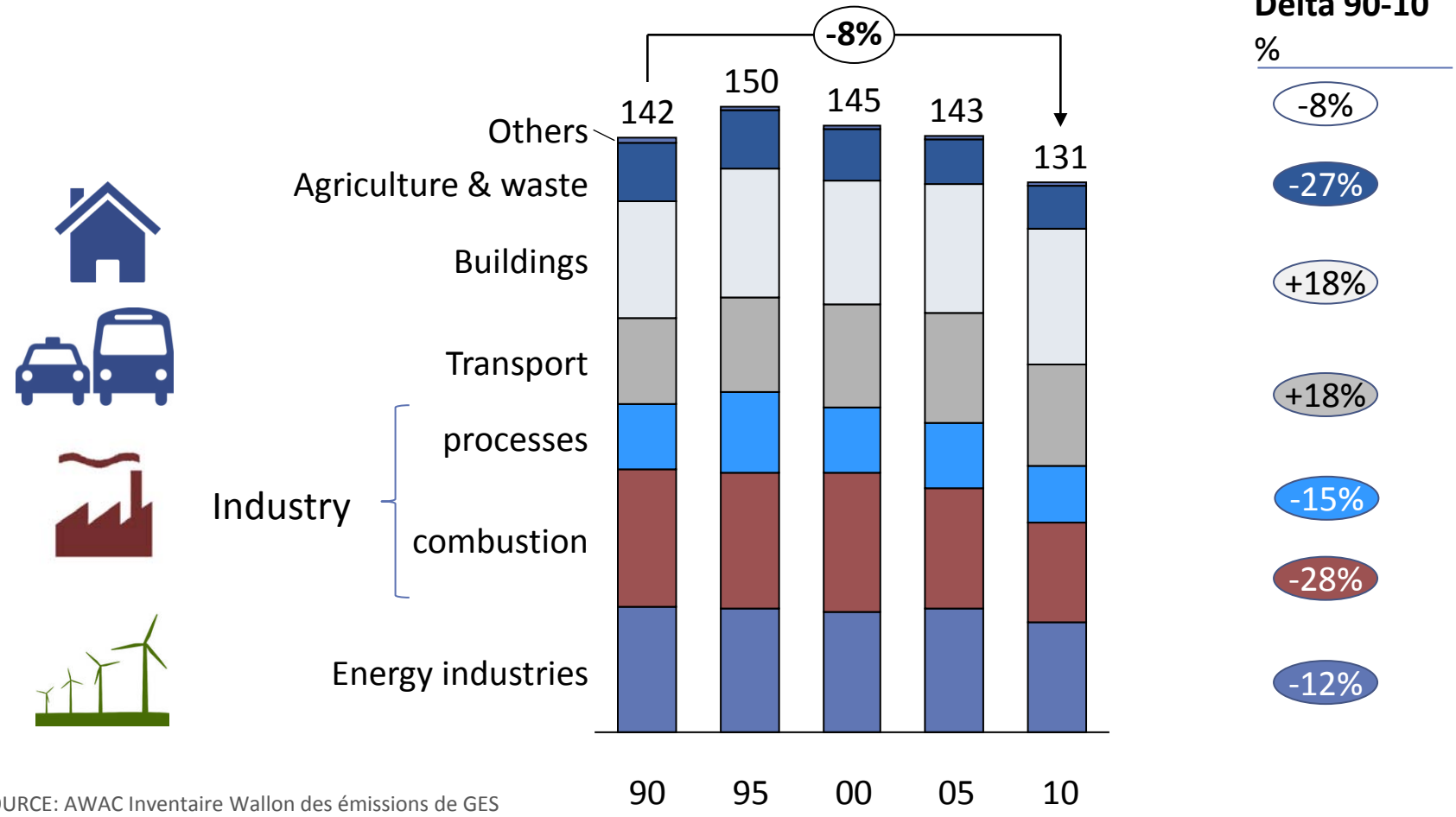
100% = 132 $MtCO_2e$



SOURCE: AWAC Inventaire Wallon des émissions de GES

Belgium has reduced its emissions by ~8% since 1990

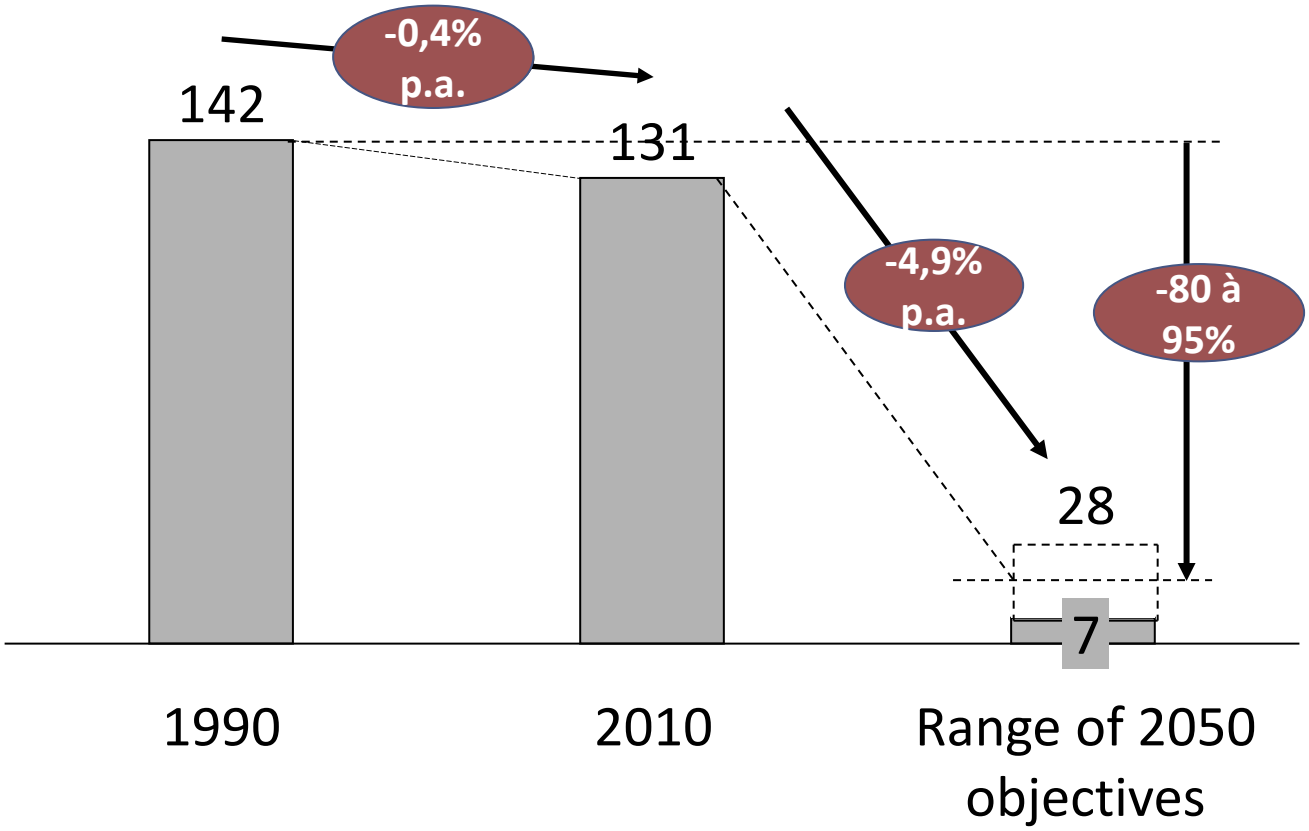
GHG emissions in Belgium, MtCO2e per year



SOURCE: AWAC Inventaire Wallon des émissions de GES

Belgium needs to massively increase its yearly GHG reduction pace in order to reach its objectives in 2050

GHG emissions in Belgium, $MtCO_2e$ per year



Source: Belgium GHG emissions inventory, Climact

Key objectives of the project « A Low Carbon Roadmap for Belgium »

Understand how to reach 2050 low carbon objectives

- **Develop low carbon scenarios** integrating existing technologies
- Clarify the **required implementation range** for key indicators

Engage key stakeholders

- Insure the development of **pragmatic and realistic conclusions in strong interaction** and with significant buy-in from **key stakeholders**

Support political decision making

- Encourage **a common vision for all**
- **Support short, medium and long term policies**

SOURCE: Climact et le comité d'accompagnement

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Wallonia can reduce its emissions by 80 to 95% by 2050

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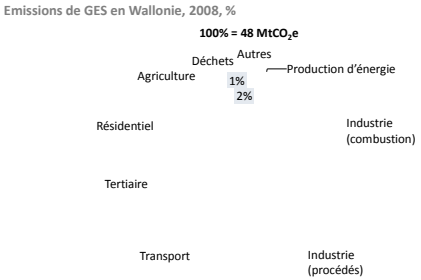
A stakeholders-based approach can be used to develop the model

1 **"Bottom-up" study by sector of potential GHG reductions**

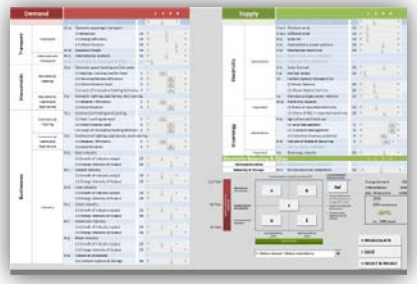


2 **Test each sector with external experts**

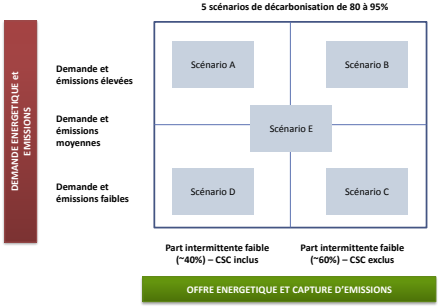
Workshops by sector with external experts

Discussions with international experts

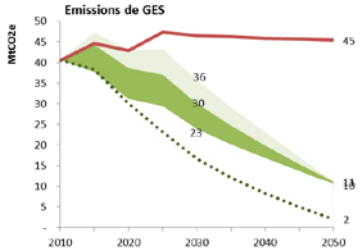
3 **Adapt the DECC model to regional data and improve it**



4 **Define and model various scenarios**



5 **Detail the implications for these scenarios**



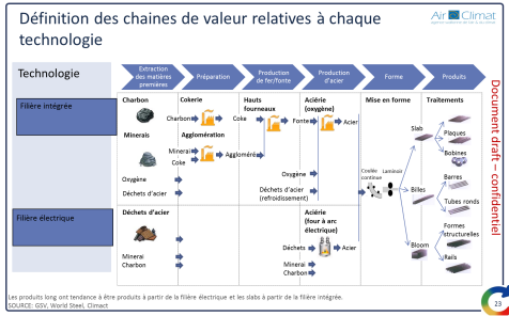
6 **Review conclusions with the Steering and Expert Committees**

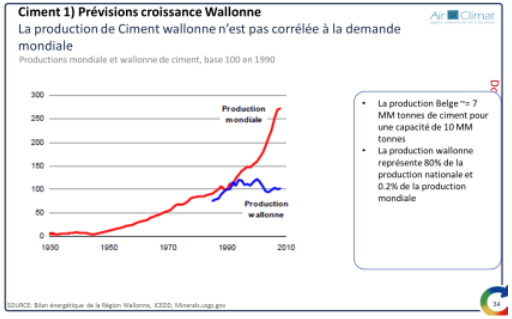
- Walloon administration
- Industry
- Civil organisations
- Academics

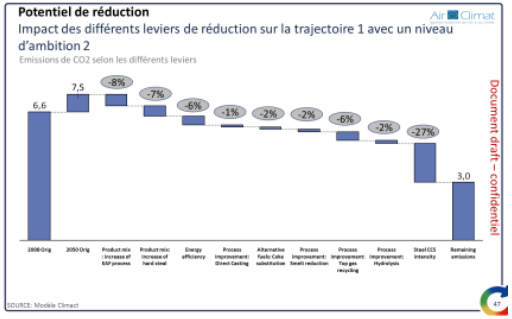
Source: Climact

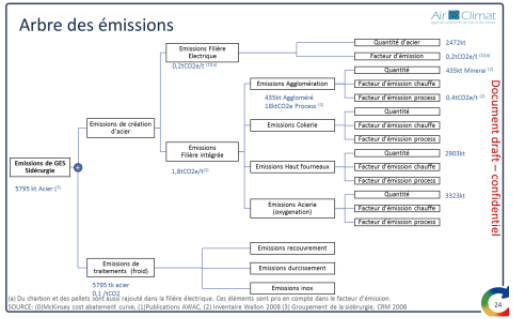
1 Industry was refined to work at the sector level

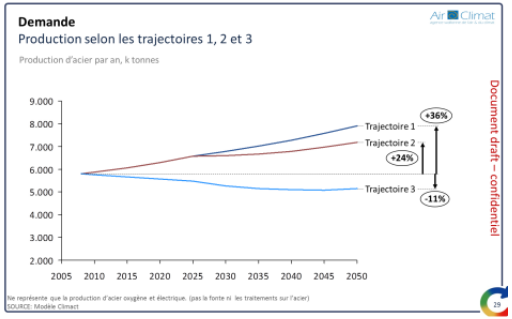
	Industry analysis	Modeling industry production trajectories	Modeling the potential for reducing GHG emissions
Analysis	Value chain definition	Growth analysis for key markets	GHG reduction levers potential/cost
Results	Modeling emissions	Production trajectories	GHG trajectories after reduction

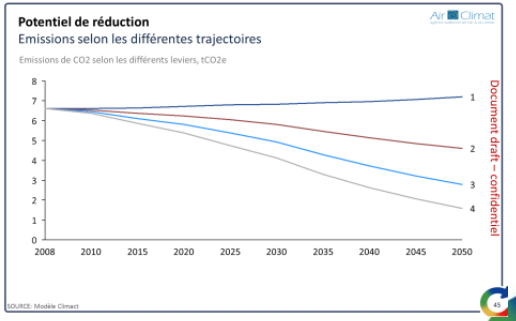












SOURCE: Climact

26 Many organizations and experts were involved

- **Public organisations**
- **Industry**
- **Civil organisations**
- **Academic experts**
- **Consumers**

Interactions

- Project initiated by the regional and federal organisations
- Project is followed by an “technical support committee”

- **High level expert committee set up to give general direction to the study**
  - Jean-Pascal van Ypersele, Vice-président du GIEC
  - Damien Ernst, Université de Liège
  - Isabelle Chaput, présidente Climate Platform FEB-UWE-VOKA-BECI
  - Union wallonne des entreprises
  - EDORA
  - FEBEG
  - ELIA, gestionnaire du réseau de transport de l’électricité
  - ORES, gestionnaire du réseau de distribution de l’électricité
  - Inter-Environnement Wallonie
  - WWF Belgique
  - DECC (Dpt énergie et changement climatique britannique)
  - Mike Hogan, ancien directeur ECF en charge de la “2050 Roadmap”
- **Working groups and specific consultations on key sectors**

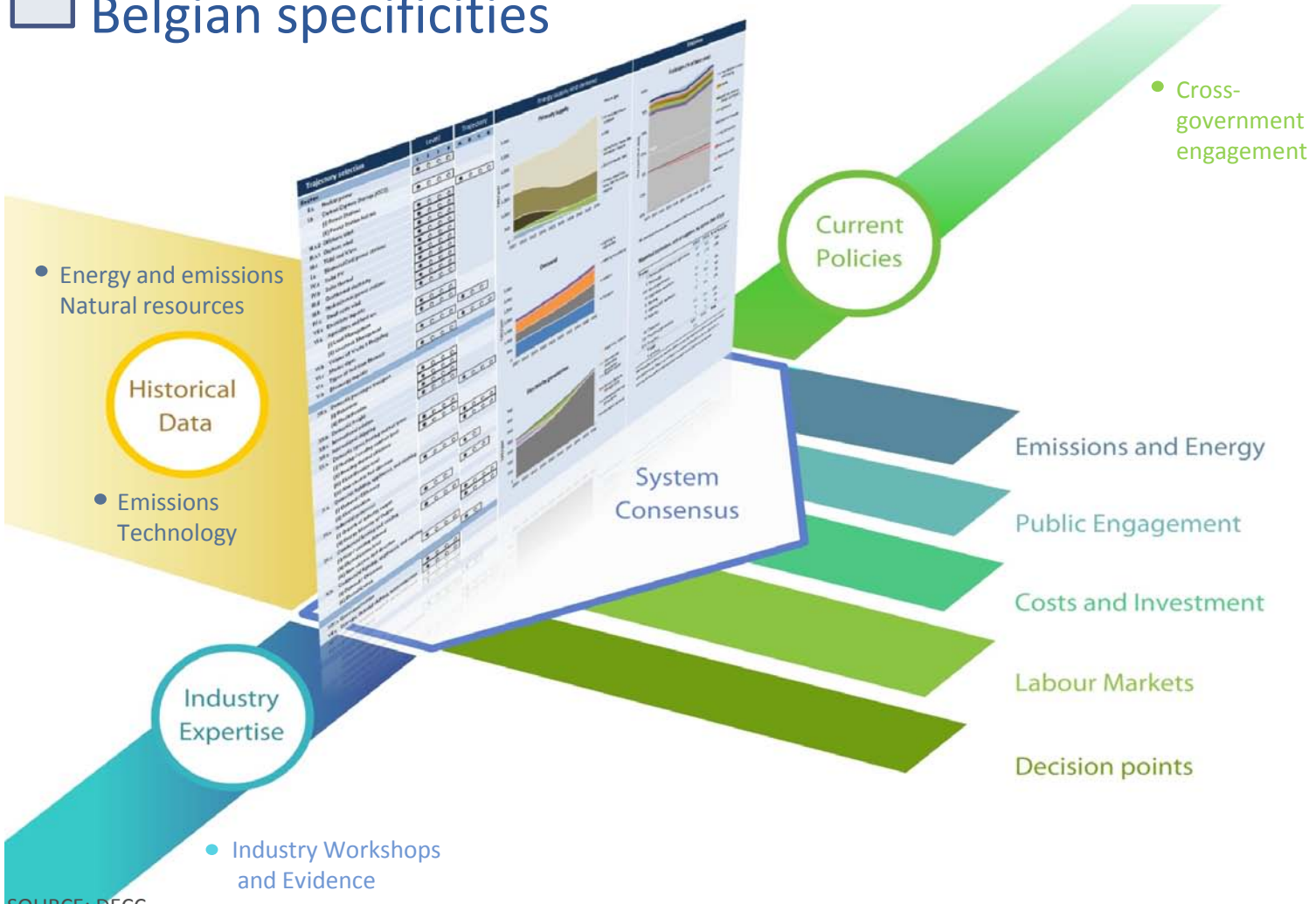
- Interactions through the communication and the webtool

SOURCE: Climact

26 Many organizations and experts were involved

Comité d'accompagnement	AWAC	A. Fourmeaux, G. Liebecq, A. Cuvelier
	Cabinet Henry	D. Defrise
	Cabinet Nollet	J. Decrop
	SPW	M. Schippers
	SPF	V. van Steenberghe (invité)
	CWEDD	O. Gulitte
Comité d'experts	ECF	R. Collyer, D. Acke
	DECC	J. Kiso
	RAP	M. Hogan
	UCL	JP van Ypersele
	ULG	D. Ernst
	IEW	M. Cors
	WWF	S. Vandenplas, J. Vandermosten
	UWE	D. Paquot, A. Lebrun
	EDORA	N. Laumont
	Plateforme Climat	I. Chaput
	FEBEG	J. Herremans

3 The model is the same as the one from the UK, but adapted to Belgian specificities



SOURCE: DECC

3 The set of input and levers is flexible and can be easily adapted based on the relevant local characteristics

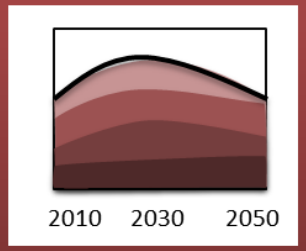
Data

Demography | Historical demand | Industrial production

DEMAND

of energy in Belgium towards 2050

by **Sector**

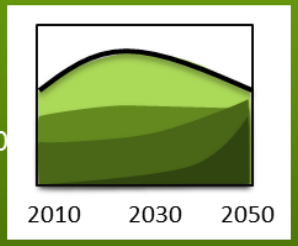


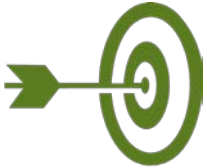
Sources availability | Energy prices

SUPPLY

of energy in Belgium towards 2050

By **Vector**





-80 to -95% GHG emissions vs. 1990

Levers

Behaviour changes | Energy efficiency | Electrification

Energy mix | Electricity mix | Imports levels

Source: Climact

3 4 ambition levels are defined for each lever

Level 1	Level 2	Level 3	Level 4
• Current minimum legal obligations • No additional effort • « Reference scenario »	• Moderate effort relatively easily achievable according to the majority of experts	• Significant effort requiring large changes, in terms of behaviours or investment requirements	• Maximum technical potential based on technical or physical constraints

Levers

- These levels are developed based on the existing literature, expert input and workshops with a range of stakeholders
- They are updated easily directly in the model

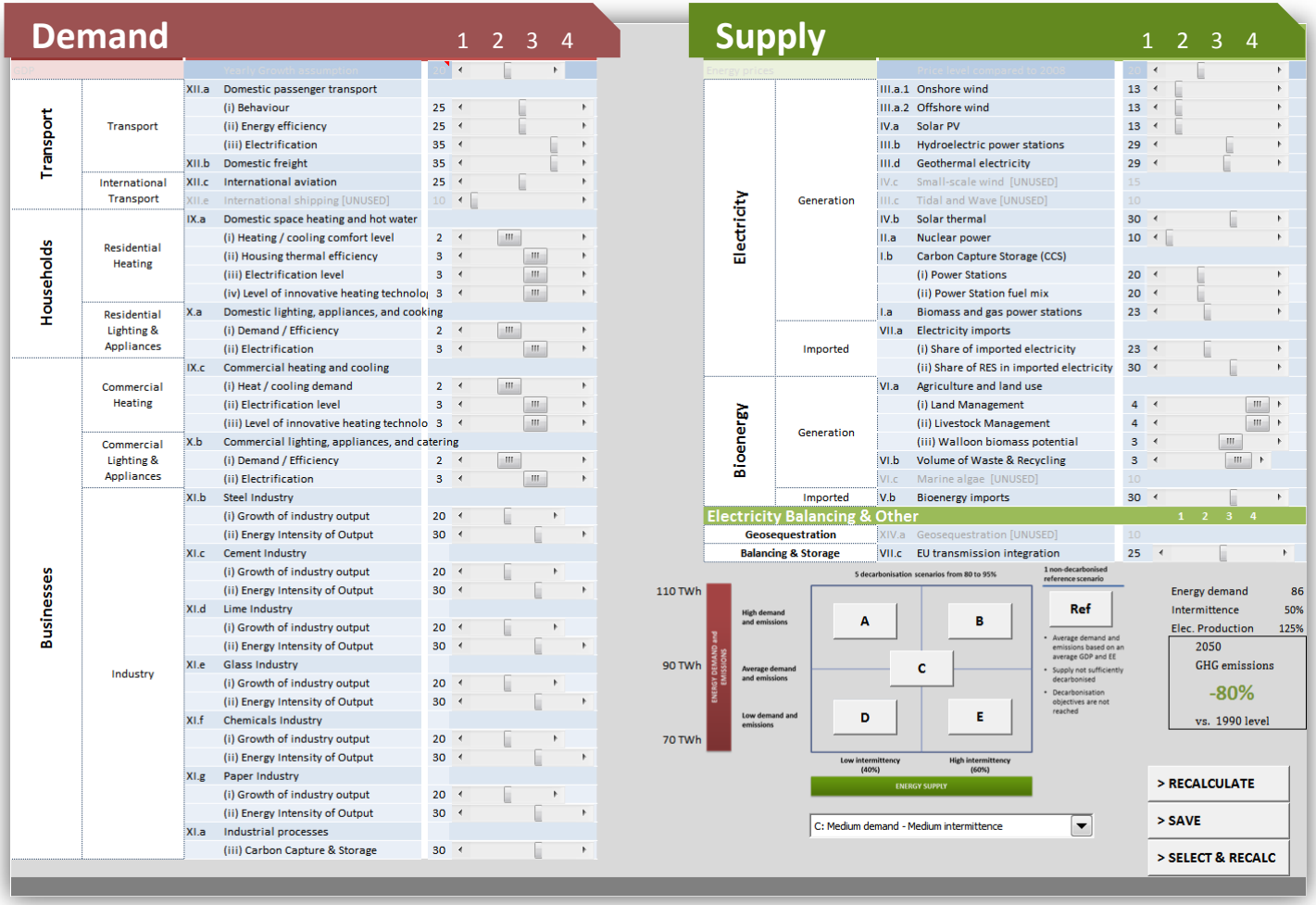
SOURCE: DECC, Climact

3 A flexible model in Excel, usable by many, interface can be modified

TRANSPORT

HOUSEHOLDS

BUSINESS

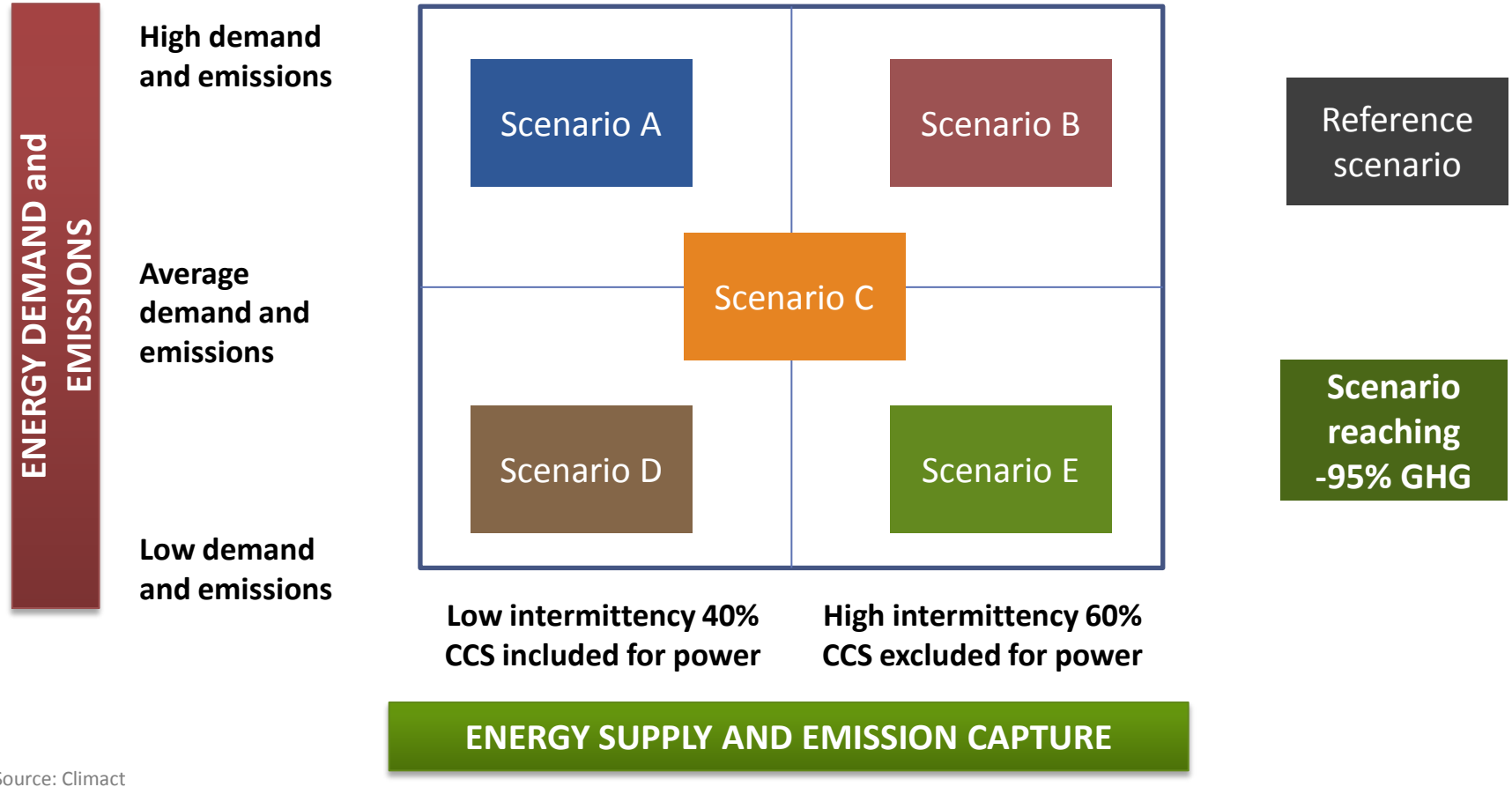


ELECTRICITY

BIO-ENERGY

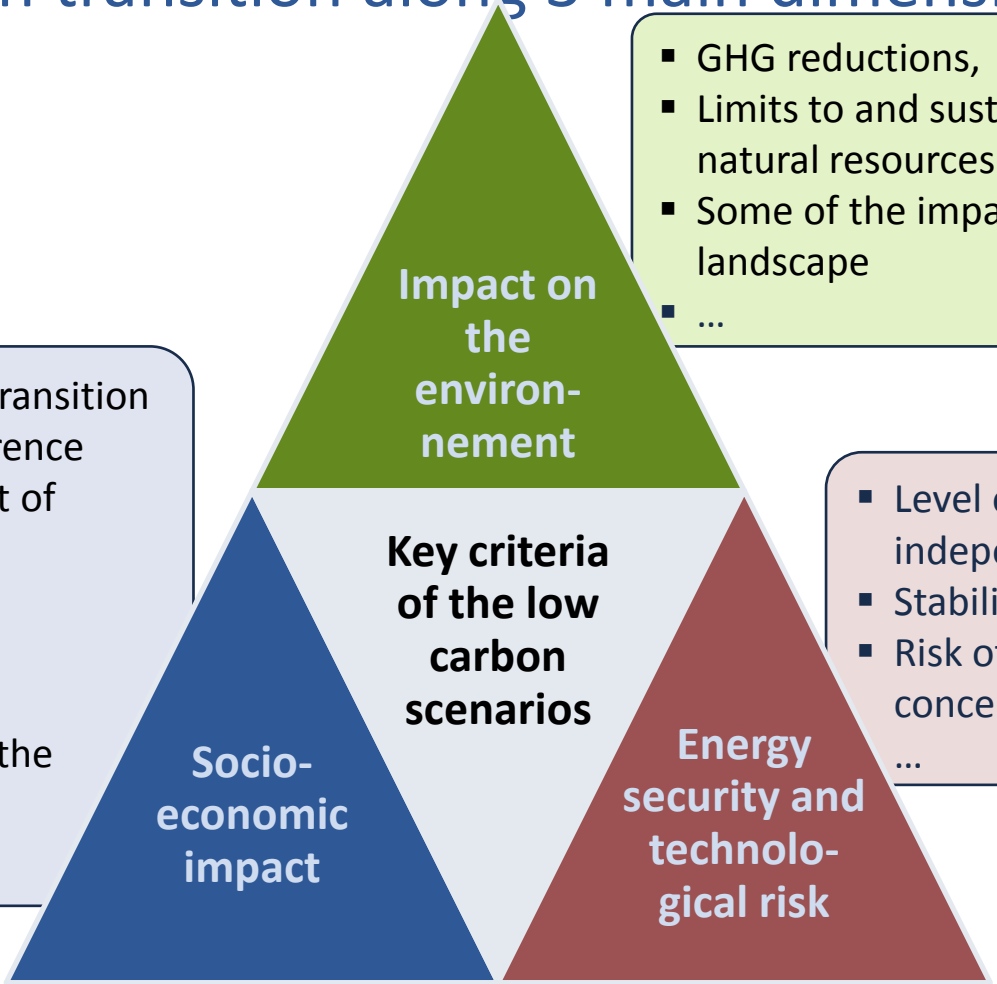
SOURCE: DECC, Climact

4 Scenarios can be built extremely flexibly combining various levels of the key parameters



Source: Climact

5 The model allowed us to test key implications of a low carbon transition along 3 main dimensions



- GHG reductions,
- Limits to and sustainable use of natural resources
- Some of the impacts on the landscape
- …

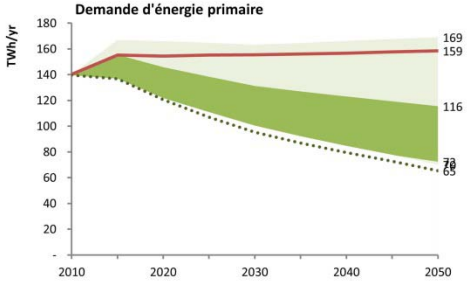
- Delta cost of the transition compared to reference
- Impact on the cost of electricity
- Total investment requirements,
- Cost by citizen
- Some impacts on the quality of life
- …

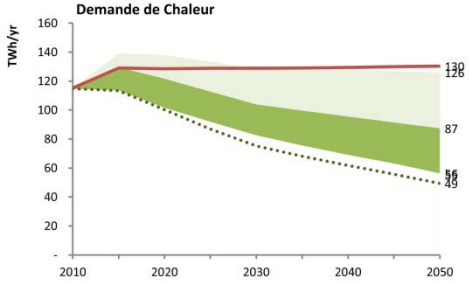
- Level of energy independence
- Stability of the power system
- Risk of technology concentration

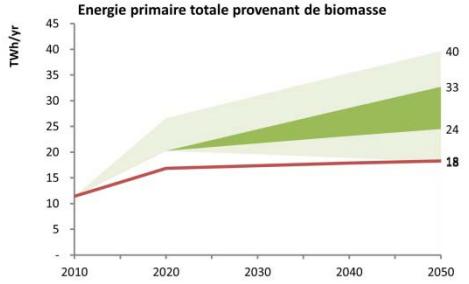
…

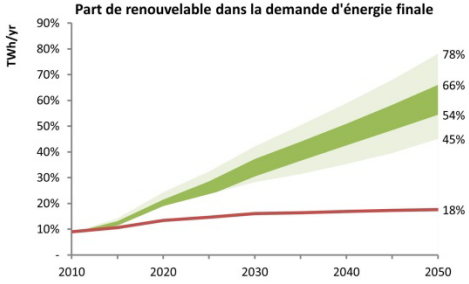
SOURCE: ECF and Climact

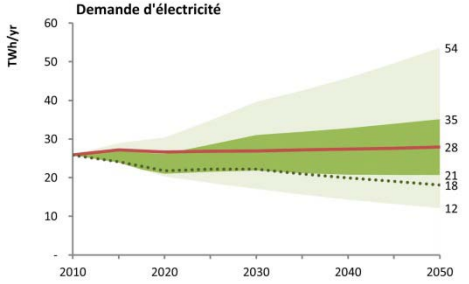
5 Outputs are varied based on multiple parameters and can be adapted easily in the Excel model

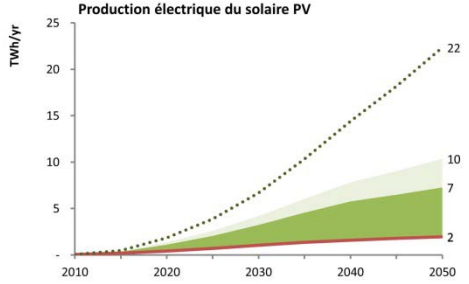


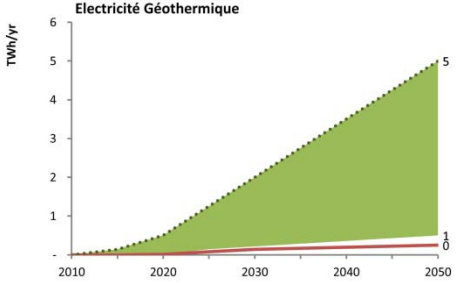


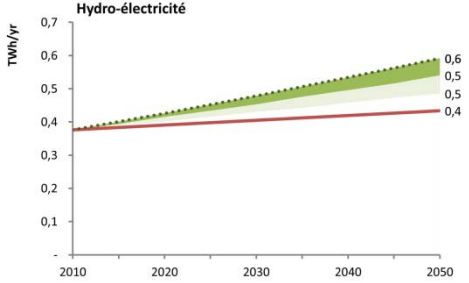


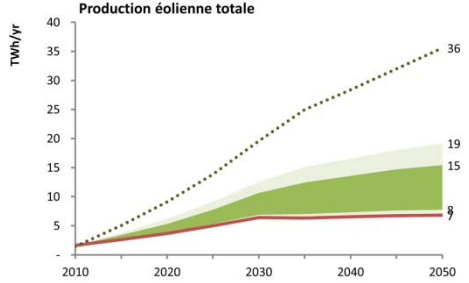






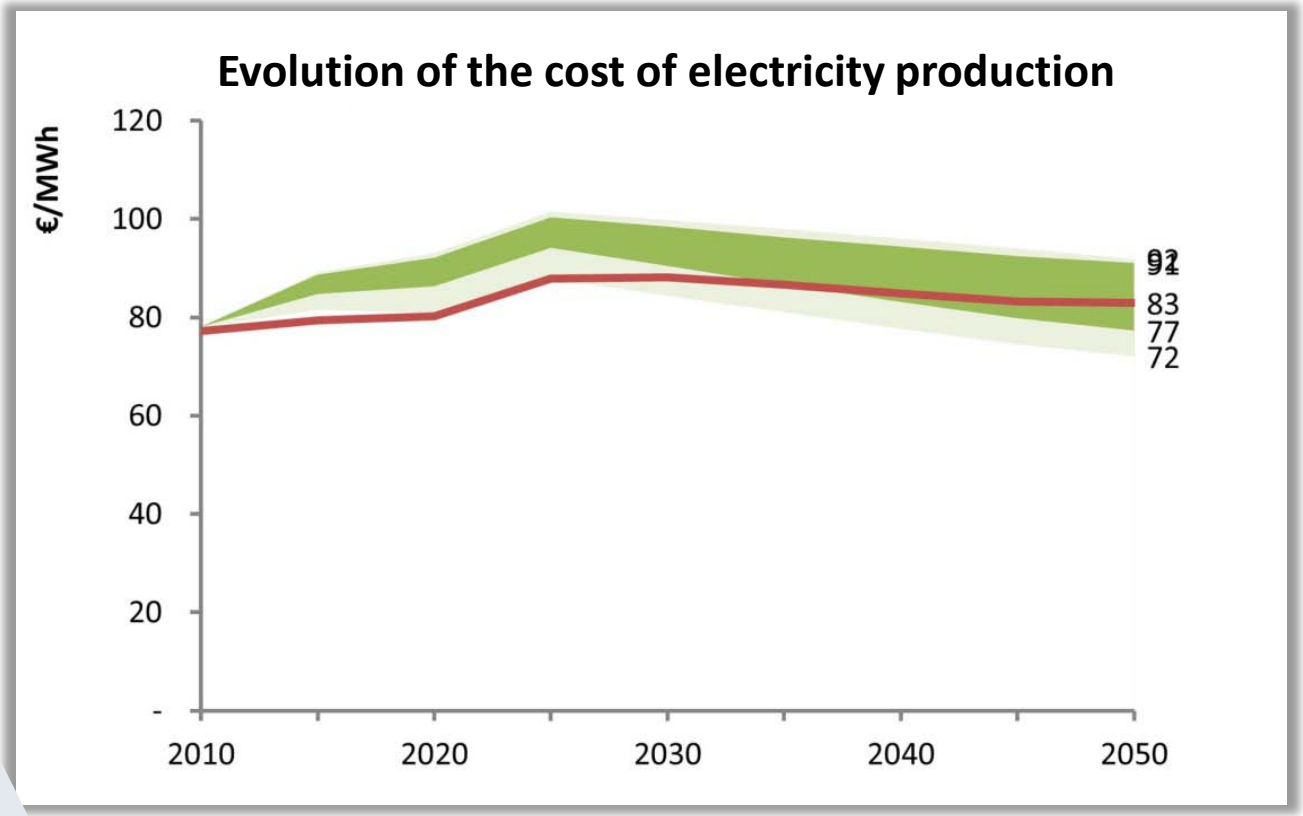


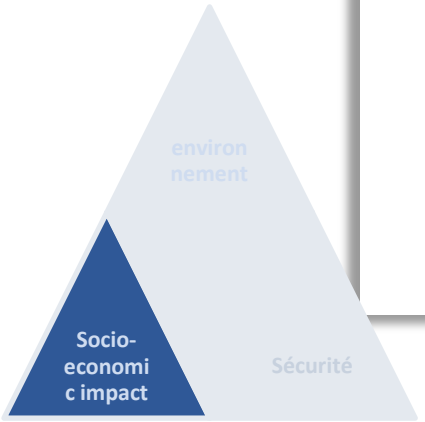




SOURCE: Climact

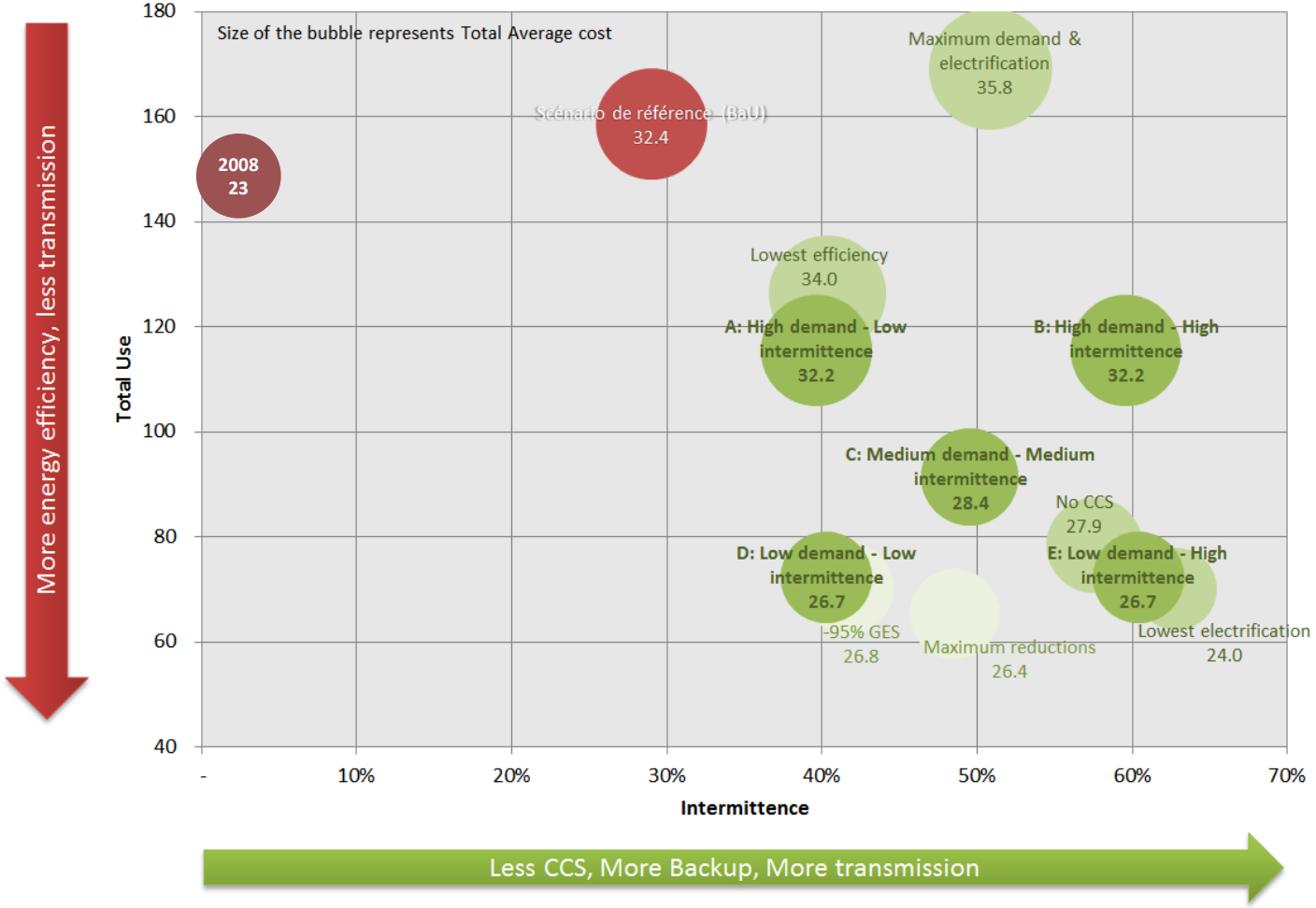
5 One of these impacts is the cost of electricity, which we added to the DECC model





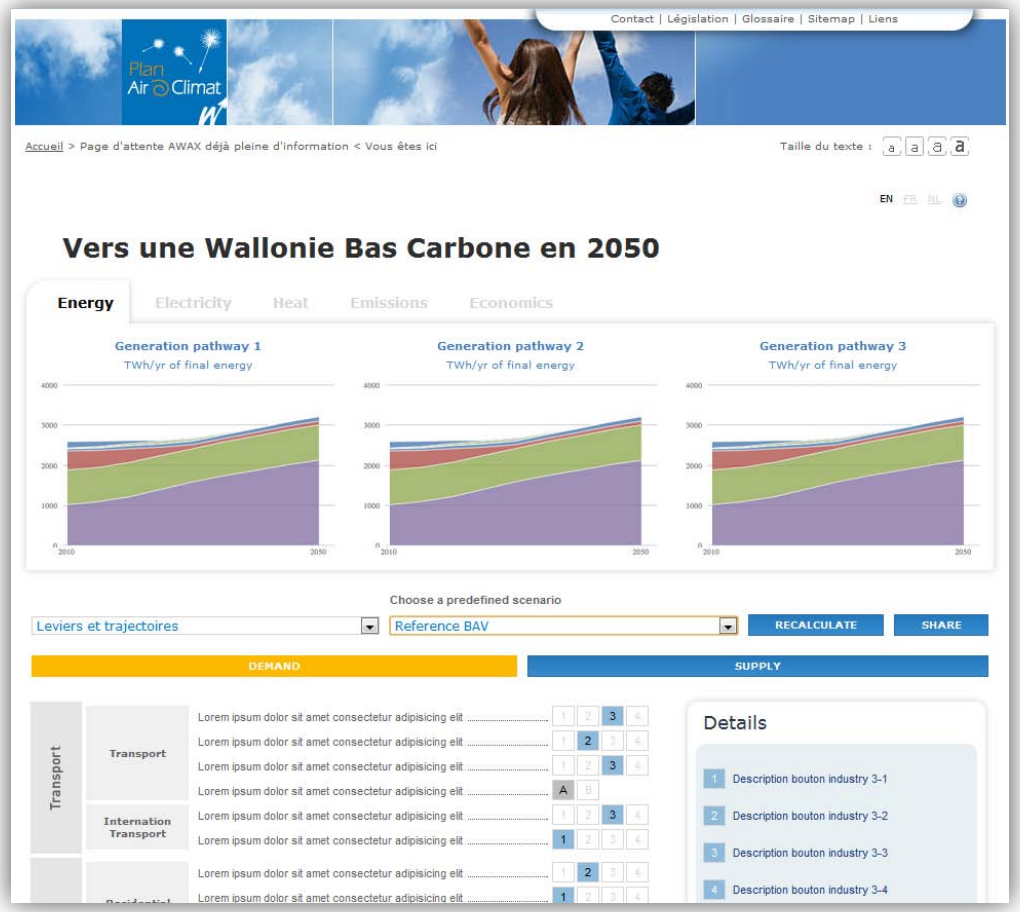
SOURCE: Climact

5 These outputs can be used to clearly illustrate the impact of the low carbon scenarios



SOURCE: Climact

6 A web version which can easily build on the excel tool



WWW. WALLONIEBASCARBONE2050.BE

SOURCE: Climact

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Wallonia can reduce its emissions by 80 to 95% by 2050

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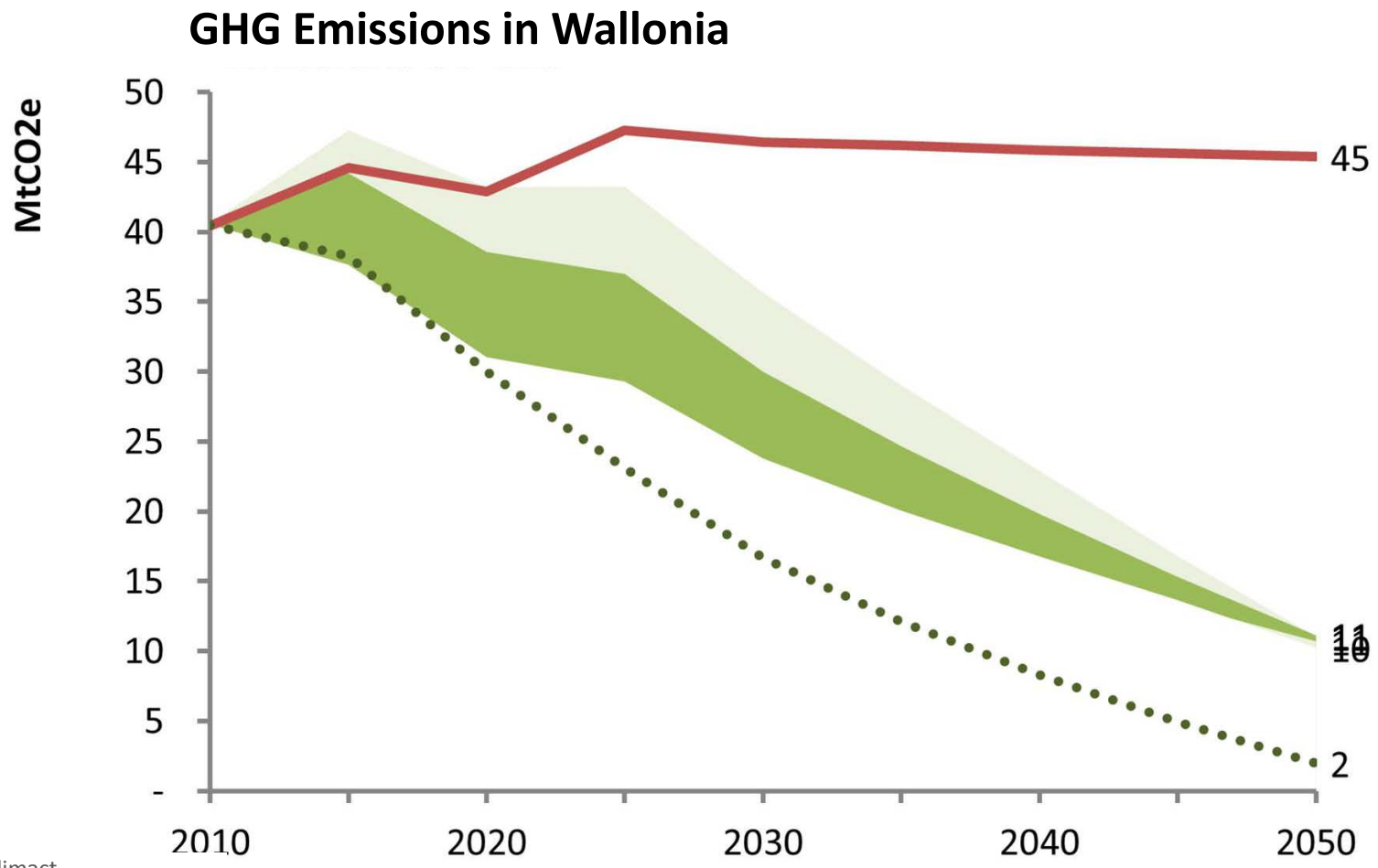
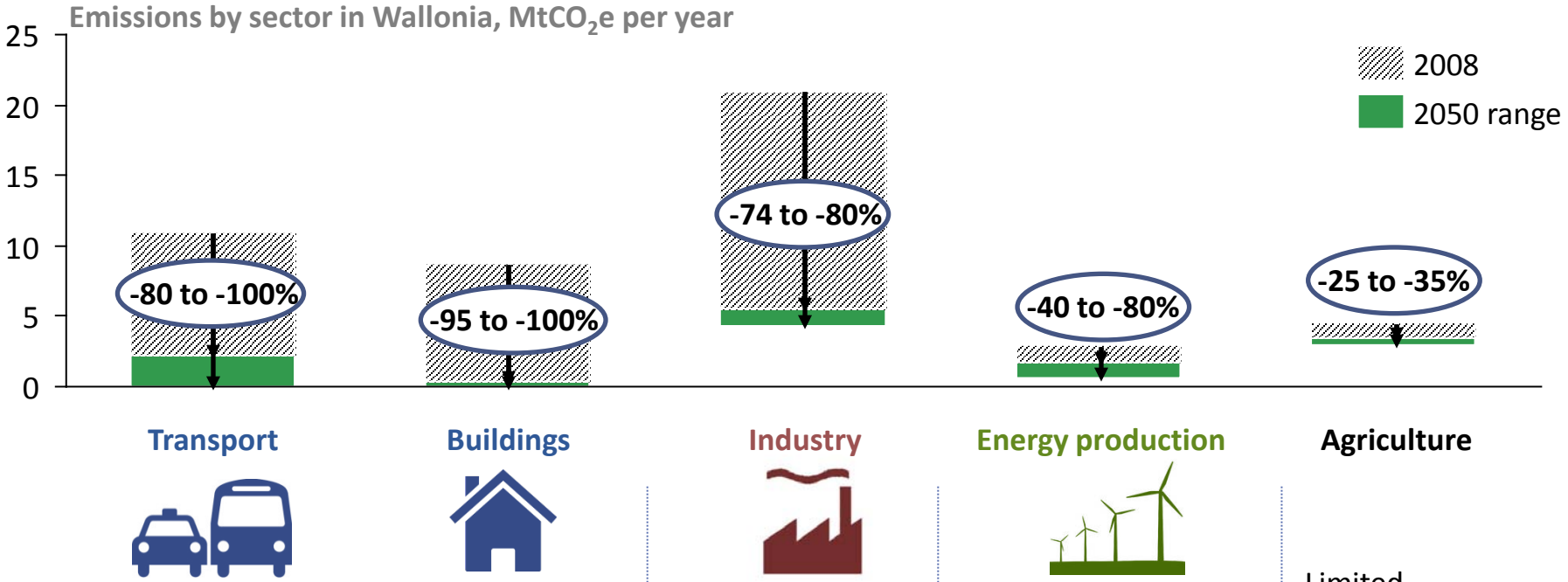
There are technical alternatives to reach the 80% to 95% GHG reduction objectives



SOURCE: Climact

Required reduction ranges by sector between 2008 and 2050 to reach an 80% reduction (vs. 1990)



Sectors with large energy efficiency and electrification potential

Energy efficiency potential, but CCS required to reach very large reductions

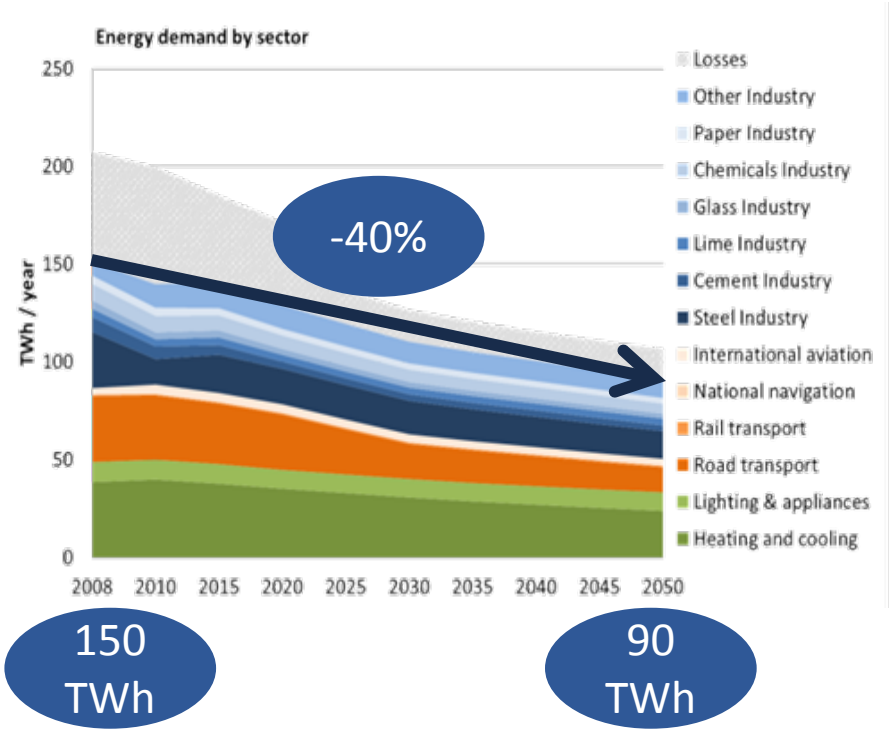
Current 75% nuclear production replaced in all scenarios

Limited technological alternatives, behavior changes required

SOURCE: Climact

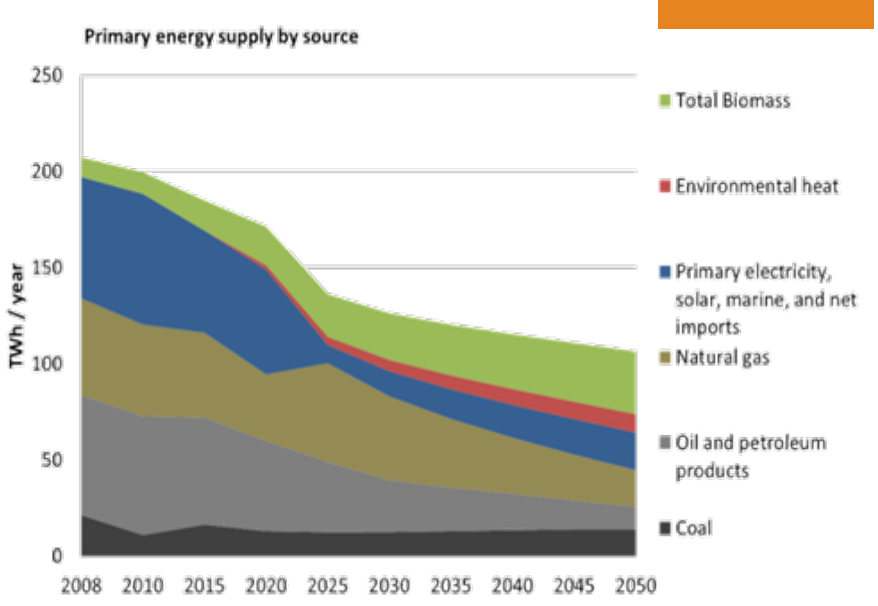
Our middle-ground scenario shows significant reductions in total primary energy demand, with a significant shift to renewable energy sources

Scénario C



150 TWh

90 TWh



SOURCE: Climact

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Julien Pestiaux – jpe@climact.com

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