

PROSPECTS+

User guide



Key steps to populating and running analysis in the tool

Guidance developed with support from:

ICAT | INITIATIVE FOR
Climate Action
Transparency



Overview

1. Introduction

- Main tool elements and navigation

2. Adding data and defining scenarios

- Input data requirements and methodology

3. Understanding the results

- Results overview and extraction

Note: These slides are intended to offer potential and existing users with an overview of key points in setting up PROSPECTS+, performing analysis and interpreting results.

Use of the tool requires intermediate Excel skills as well as a good understanding of modelling emissions across different sectors.

Analysts are likely to benefit from further, more detailed, training in addition to reviewing the slides here in order to ensure a full understanding of how the model works and the suitability of its use for a given situation.



Introduction

Parts of the tool, navigation and selection across simple and complex sector representations

Model and documentation is freely accessible via NewClimate Institute website

30 NOV 2018
PROSPECTS+

Country Summary

Download Tool

Download Documentation

Introduction to the Tool

PROSPECTS

PROSPECTS is a sector-level, bottom-up Excel tool which uses decarbonisation relevant activity and intensity indicators to track and project overall and sectoral GHG emissions trends. A simplified tool derived from the CTI tools, PROSPECTS covers all emissions-generating sectors: electricity, heat, buildings, transport, various industrial sectors, waste, and agriculture. Users can construct their own emissions scenarios by adjusting policy-relevant indicators in this open-source, user-friendly tool.

If you would like to know more about the tool, please contact: [Gustavo de Viviero](#) or [Anna Nilsson](#). This tool is part of the [COMPASS-toolbox](#).

Project applications:

Associated Publications:

A roadmap for the power supply sector in Argentina Feb 2020
The "Ambition to Action" (A2A) project provided support to the Argentinian NDC process between March..... [Read More](#)

Comment on Paris compatibility of "Plataforma" scenarios Jan 2019



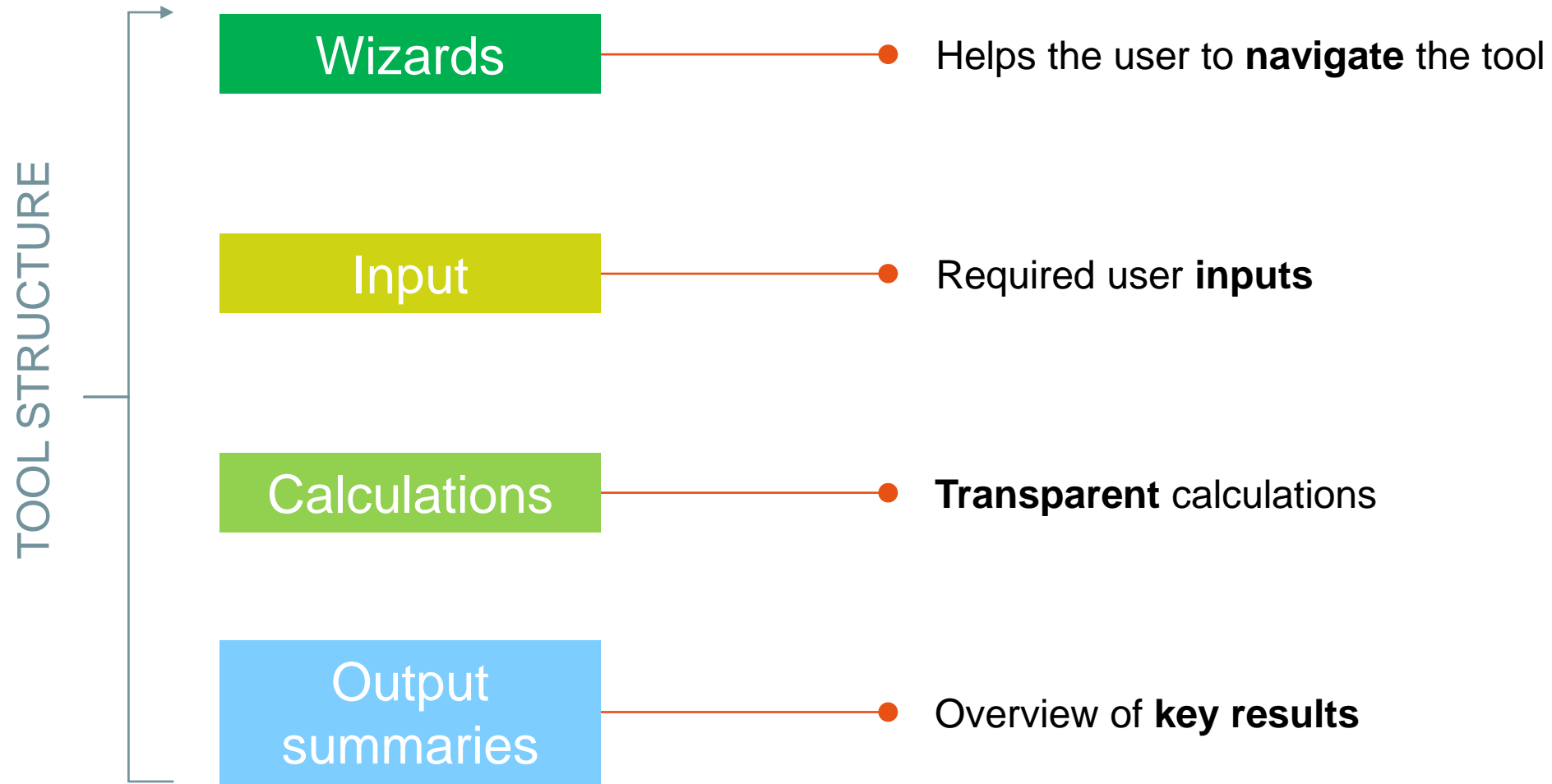
PROSPECTS+ model as downloadable Excel file



Methodology document and supporting materials



Tool elements and navigation



Navigation wizards

Step-by-step wizard Example Country

Click for info i

PROSPECTS+

Click the buttons to navigate, percentage indicates progress of data input
To develop a scenario, the user should first enter historical data and then enter assumptions on future developments

1. Enter historical data

100.00%

2. Enter projections

3. Data validation

4. Results

Cover Wizard Wizard - Sectors Wizard - Industry Wizard - Buildings Wizard - Transport

Allows users to quickly **navigate** between various steps by **clicking buttons**

Wizard for sectors **guides the user** to locate where input data for specific sectors is captured

Input sheets and data requirements

Input - References

Input - Historical Data

Input - IEA Data

Input - Create Scenarios

Workbook - Historical Data

Workbook - Scenarios

Input data from the user is required in **three** different sections of PROSPECTS+:

» Historical data

- Activity data
- Intensity data

» IEA data

- Copy-paste from IEA energy balances
- Requires a (paid for) user license

» Scenario development

- Users own calculations and projections, or projections from other tools

Input – Historic data

Dedicated space for the user to develop own calculations / harmonize raw data

| Metric | Unit | Source(s) | Comments | Input required | 1990 | 1991 |
|---|-------------|-----------|----------|----------------|------|------|
| Transport - international aviation | | | | | | |
| Add values specified in table below. Please do not add any rows or columns. If extra rows are needed please use the space under "Calculations" below and link them to this table. | | | | | | |
| Aviation activity | billion pkm | | | input required | 2.9 | 3.3 |
| Fuel mix for int'l aviation | | | | | | |
| % Biofuel | % | | | input required | 0% | 0% |
| % Jet fuel | % | | | input required | 100% | 100% |
| Fuel energy intensity | | | | | | |
| Biofuel | MJ / pkm | | | input required | 2.75 | 2.75 |
| Jet fuel | MJ / pkm | | | input required | 2.75 | 2.75 |
| Calculations | | | | | | |
| Add rows and columns as needed. Link results to table above | | | | | | |
| Buildings - residential | | | | | | |
| Add values specified in table below. Please do not add any rows or columns. If extra rows are needed please use the space under "Calculations" below and link them to this table. | | | | | | |
| Back to input | | | | | | |
| Metric | Unit | Source(s) | Comments | Input required | 1990 | 1991 |
| Floor space residential | million m² | | | input required | 1341 | 1407 |
| Electricity use in residential sector - cooling | TWh | | | input required | 0 | 0 |
| Electricity use in residential sector - heating (space and water) | TWh | | | input required | 0 | |
| Electricity use in residential sector - cooking/appliances/lighting | TWh | | | input required | 4 | 4 |
| Direct energy use in residential sector - heating (space and water) | PJ | | | input required | 53 | 56 |
| Direct energy use in residential sector - cooking/appliances/lighting | PJ | | | input required | 30 | 32 |

Raw data and calculations are inserted in the 'Workbook – Historical data' sheet

Data input

Input data is automatically linked to 'Input – Historical data' sheet

Input IEA data

← Back to wizard

Data is copied from IEA Energy Balances and pasted to the 'Input – IEA data' sheet

Raw data - Calculations based on IEA Statistics **Example Country**

[back to cover](#)

To calculations This sheet does not require further calculations. The only thing the user should do here is update the IEA data. In total, **seven tables have to be pasted** here from: world_bigco2.ivt and woig.ivt. The format of the tables is the same as should be produced in the 20/20 Browser

General

Raw Data
Here the data can be pasted from the IEA 20/20 browser.

| COUNTRY | | | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|------------------|---------------------|---------------------------|------|------|------|------|------|------|------|------|
| 0 | | | | | | | | | | |
| FLOW (Mt of CO2) | FLOW (Mt of CO2) | PRODUCT | | | | | | | | |
| Total | CO2 Fuel Combustion | Total | | 37 | 39 | 40 | 40 | 43 | 44 | 47 |
| Coal | CO2 Fuel Combustion | Hard coal (if no detail) | x | x | x | x | x | x | x | x |
| Coal | CO2 Fuel Combustion | Brown coal (if no detail) | x | x | x | x | x | x | x | x |
| Coal | CO2 Fuel Combustion | Anthracite | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coal | CO2 Fuel Combustion | Coking coal | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coal | CO2 Fuel Combustion | Other bituminous coal | | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| Coal | CO2 Fuel Combustion | Sub-bituminous coal | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coal | CO2 Fuel Combustion | Lignite | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coal | CO2 Fuel Combustion | Patent fuel | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coal | CO2 Fuel Combustion | Coke oven coke | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coal | CO2 Fuel Combustion | Gas coke | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coal | CO2 Fuel Combustion | Coal tar | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coal | CO2 Fuel Combustion | BKB | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coal | CO2 Fuel Combustion | Gas works gas | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coal | CO2 Fuel Combustion | Coke oven gas | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coal | CO2 Fuel Combustion | Blast furnace gas | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Coal | CO2 Fuel Combustion | Other recovered gases | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Input – Scenario building

Workbook - Scenarios **Example Country**

[back to cover](#)

This sheet allows the user to define developments for up to eight scenarios, which can be combined in in the Input - Combine Developments sheet.

Define developments

| DevelopmentNames | | Description |
|-------------------|--------------------------------|-------------|
| Frozen technology | Go to scenario | |
| Developments 1 | Go to scenario | |
| Developments 2 | Go to scenario | |
| Developments 3 | Go to scenario | |
| Developments 4 | Go to scenario | |
| Developments 5 | Go to scenario | |
| Developments 6 | Go to scenario | |
| Developments 7 | Go to scenario | |
| Developments 8 | Go to scenario | |

Frozen technology
The frozen technology scenario keeps all indicators constant at their base year levels and can be used as a consistency check for the tool.

Developments 1
Add values specified in table below. Please do not add any rows or columns. If extra rows are needed please use the space under "Calculations" below and link them to this table.

[Back to scenarios \(combine developments\) \(Click\)](#)

[Back to top \(Click\)](#) [Back to scenarios \(combine developments\) \(Click\)](#)

Background calculations are developed in the 'Workbook – Scenarios' sheet

Potential to develop **nine different developments** which can be **combined** across sectors to create scenarios

Input - Historical Data | Input - IEA Data | Input - Create Scenarios | Workbook - Historical Data | **Workbook - Scenarios** | Country Summary | Energy Sec ...

Input – Scenario building

Workbook - Scenarios Example Country

back to cover

This sheet allows the user to define developments for up to eight scenarios, which can be combined in the Input - Combine Developments sheet.

Define developments

Back to scenarios
(combine developments)
(Click)

| DevelopmentNames | Description |
|-------------------|--------------------------------|
| Frozen technology | Go to scenario |
| Developments 1 | Go to scenario |
| Developments 2 | Go to scenario |
| Developments 3 | Go to scenario |
| Developments 4 | Go to scenario |
| Developments 5 | Go to scenario |
| Developments 6 | Go to scenario |
| Developments 7 | Go to scenario |
| Developments 8 | Go to scenario |

Input data is **automatically** linked to 'Input – create scenarios'

Projections are **added** by the **user**

Frozen technology
The frozen technology scenario keeps all indicators constant at their base year levels and can be used as a consistency check for the tool.

Do not add rows or columns to the table below.

| Input validation | Sector | Sources | Description of quantification | Related sectoral indicators | | Projection | | | | | | |
|------------------|--|------------|-------------------------------|----------------------------------|-------------|-------------|-----------------|----------------|------|-------|--|-------|
| | | | | Indicator | Unit | Metric | Input required | 2015 | 2016 | 2017 | | |
| | General | | | | | | | | | | | |
| | | Assumption | No growth assumed | Direct energy emission intensity | Coal | MtCO2e / PJ | Growth rate (%) | input required | | 0.00% | | 0.00% |
| | | Assumption | No growth assumed | | Natural gas | MtCO2e / PJ | Growth rate (%) | input required | | 0.00% | | 0.00% |
| | | Assumption | No growth assumed | | Oil | MtCO2e / PJ | Growth rate (%) | input required | | 0.00% | | 0.00% |
| | | Assumption | No growth assumed | | Waste | MtCO2e / PJ | Growth rate (%) | input required | | 0.00% | | 0.00% |
| | | Assumption | No growth assumed | | Biofuel | MtCO2e / PJ | Growth rate (%) | input required | | 0.00% | | 0.00% |
| | | Assumption | No growth assumed | | Non-fossil | MtCO2e / PJ | Growth rate (%) | input required | | 0.00% | | 0.00% |
| | Electricity | | | | | | | | | | | |
| | Heat | | | | | | | | | | | |
| | Industry cement | | | | | | | | | | | |
| | Industry steel | | | | | | | | | | | |
| | Transport - passenger | | | | | | | | | | | |
| | Transport - freight | | | | | | | | | | | |
| | International aviation | | | | | | | | | | | |
| | Transport sectoral (simplified approach) | | | | | | | | | | | |
| | Buildings - residential | | | | | | | | | | | |
| | Buildings - commercial | | | | | | | | | | | |
| | Oil & gas | | | | | | | | | | | |
| | Other industry - general | | | | | | | | | | | |
| | Other industry - light | | | | | | | | | | | |
| | Other industry - heavy | | | | | | | | | | | |
| | Agriculture - energy use | | | | | | | | | | | |
| | Agriculture - animal-related | | | | | | | | | | | |

Projections are inserted for the **analysis sectors of interest**

Input - References | Input - Historical Data | Input - IEA Data | Input - Create Scenarios | Workbook - Historical Data | **Workbook - Scenarios** | Country Su ...

Input – Scenario building

- » **Various scenarios** can now be created by **combining** different *developments across sectors*
- » e.g.
 - Scenario #1 can be a combination of:
 - » **Ambitious policies** in the electricity sector building sector (*development 3*)
 - » **Energy efficiency** measures in the industry sector (*development 2 and 4*)
 - » **Business-as-usual** assumptions in other sectors (*development 1*)

| Combine developments | Input validation | Sector | Sources |
|----------------------|------------------|-----------------------|---------|
| Developments 1 | | General | |
| Developments 3 | | Electricity | |
| Developments 1 | | Heat | |
| Developments 2 | | Industry cement | |
| Developments 4 | | Industry steel | |
| Developments 1 | | Transport - passenger | |
| Developments 1 | | Transport - freight | |

Calculation - Elec & Heat

Calculation - Buildings

Calculation - Transport

Calculation - Industry Steel

Calculation - Industry Cement

Calculati

- » Each **sector** has **one** dedicated calculation sheet
- » Provides a **transparent** overview of how the results are calculated
 - Grouped into:
 - Indicators → **summary of historic data**
 - Projections based on policy evaluation → **parameter projections**
 - Emissions → **results**
 - Energy → **results**
- » If specific results are desired which are not provided in the results summary, these can be **extracted** from the calculation sheets by the **user**

Calculations – required actions from the user

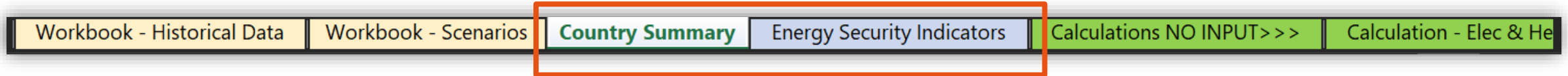
» The calculation sheets require **no input from the user**. However, the **Pivot table** should be **updated by the user** before displaying the results.

» This is done by clicking the **'Update Pivot Table'** button in the 'ForPivotTable' sheet.

The screenshot displays an Excel spreadsheet with a PivotTable. At the top, a red arrow points to a button labeled "Back to overview". To its right is a grey button labeled "Go to PivotTable with all results". Further right, a button labeled "Update Pivot Table (recalculation of table below)" is highlighted with a red box. Below these buttons, a text box explains: "This sheet collects all indicator's values from the sector calculation sheets. These data are displayed in the pivot table. Values might return errors: some indicators only show data for historic and or projected years and some data are only produced when a sector is analysed with a simplified or non-simplified approach". The PivotTable below has columns for Sector, ID Unique/ID Proj/Emi_ID/Ener_ID, and Metric. The data rows show "Electricity Prod Total" for the "Elec & Heat" sector. At the bottom, a navigation bar shows several tabs: "Calculation - Other Industry", "Calculation - Oil & Gas", "Calculation - Waste", "Calculation - Agriculture", and "ForPivotTable", which is highlighted with a red box. A red arrow points from the "Update Pivot Table" button to the "ForPivotTable" tab.

| | Pasted values from column L | Sector | ID Unique/ID Proj/Emi_ID/Ener_ID | Metric | Unit | ID_Gene |
|----|------------------------------------|-------------|----------------------------------|--|------|---------|
| 10 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 11 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 12 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 13 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 14 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 15 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 16 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 17 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 18 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 19 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 20 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 21 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 22 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 23 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 24 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 25 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 26 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 27 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 28 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 29 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 30 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 31 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 32 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 33 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 34 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 35 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 36 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 37 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 38 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 39 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 40 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 41 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |
| 42 | Electricity Electricity Prod Total | Elec & Heat | Electricity_Prod_Total | Electricity Prod Total - Electricity gener | TWh | Prod |

Interpretation of results



- » The scenario results are **summarised** in the ‘Country Summary’ sheet
- » Energy security indicators are automatically derived from the results in the “Energy Security Indicators’ sheet
- » **More granular** results for specific **sectors** can be **extracted** by the user from the calculation sheets

Interpretation of results: Country summary

The country summary provides an **overview of key results**, including:

» Energy

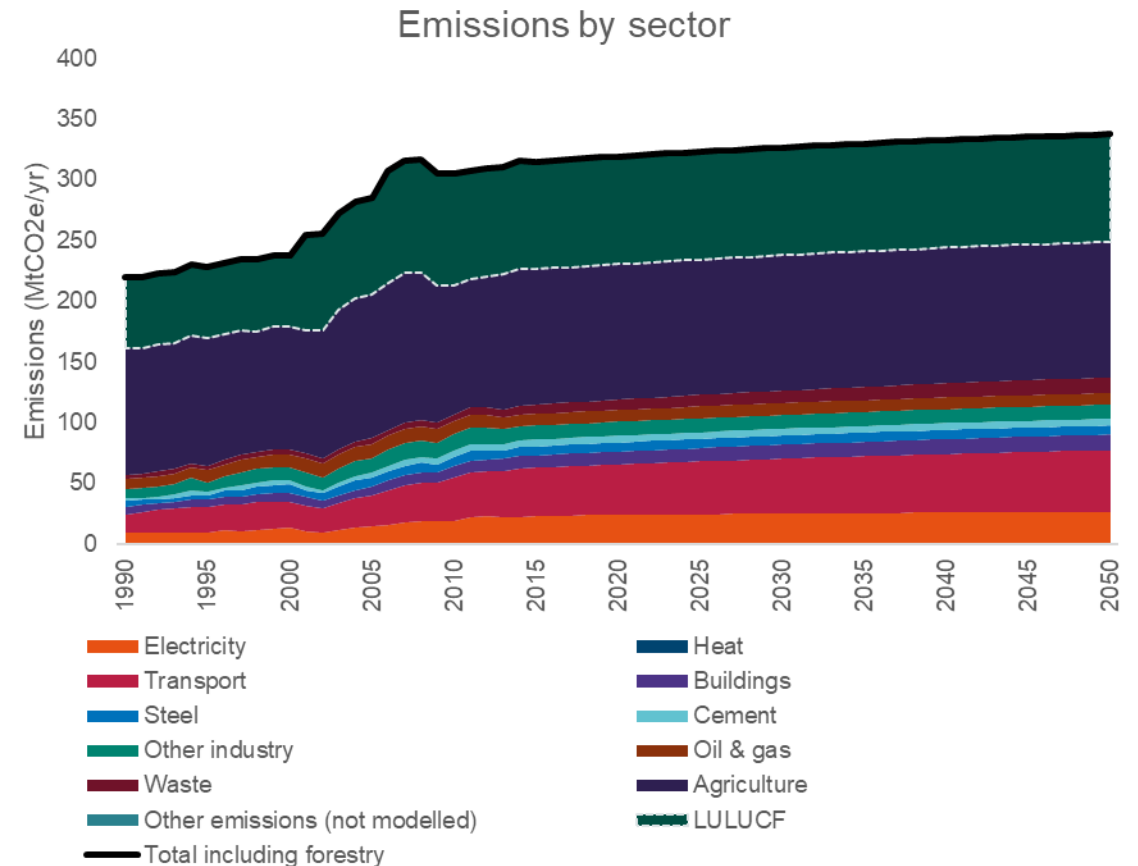
- Final energy demand
 - Final electricity demand
- } By sector and fuel type

» Emissions (CO₂, CH₄, N₂O)

- Direct energy
 - Electricity
 - Non-energy (agriculture and waste)
- } By sector and fuel type

» Key indicators

- Emissions per capita
- Energy consumption per capita
- Electricity consumption per capita

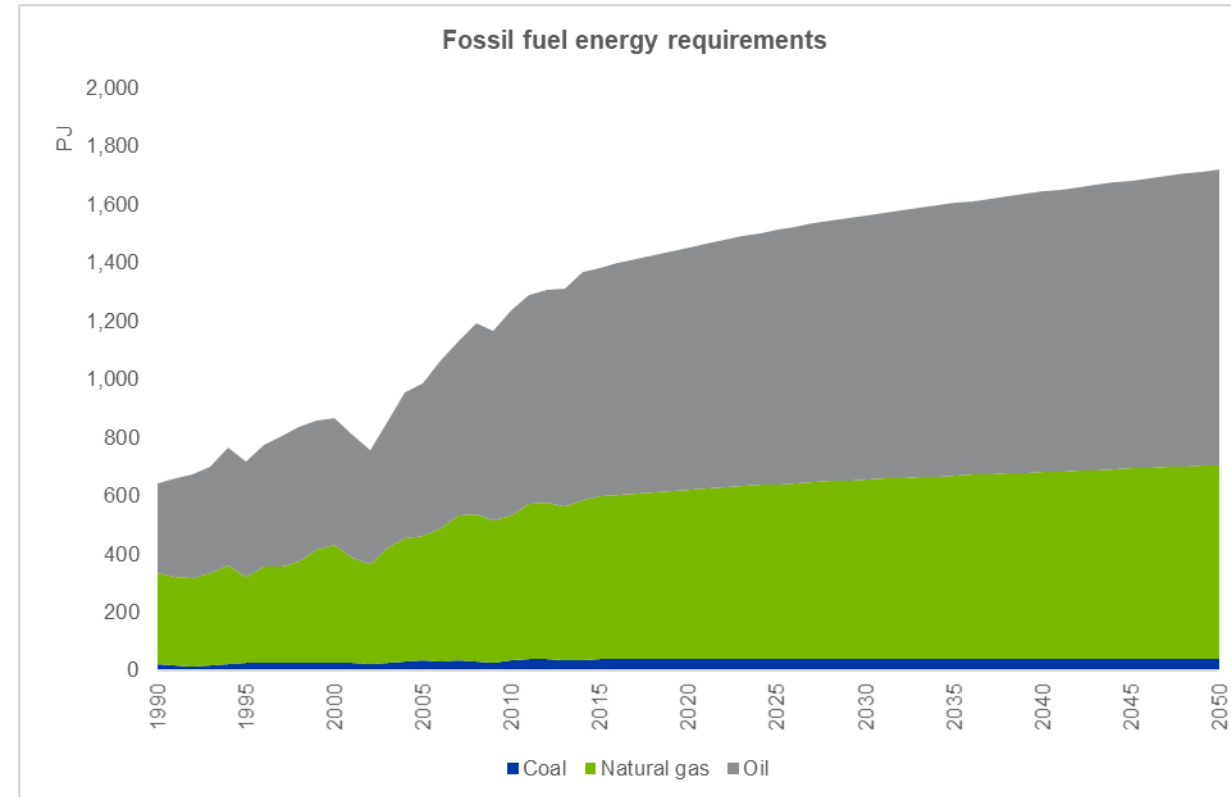


Interpretation of results: Energy security

» A set of indicators related to **energy security** are provided, including (non-exhaustive):

- Diversity of supply across fuel types
- Share of electricity supply from intermittent technologies and from imports
- Share of fossil fuels in primary energy supply
- Fossil fuel energy requirements
- Opportunity cost of fossil fuel energy requirements

» Allows for the analysis of **implications** on energy security **across scenarios**



QUESTIONS / COMMENTS / FEEDBACK

**NEW
CLIMATE**
INSTITUTE

Anna Nilsson

a.nilsson@newclimate.org

Gustavo de Vivero

g.devivero@newclimate.org

Guidance developed with support from:

ICAT | INITIATIVE FOR
**Climate Action
Transparency**