



This project is co-financed by the European Union  
and the Republic of Turkey.

Technical Assistance for Developed Analytical Basis for  
Formulating Strategies and Actions towards  
Low Carbon Development



# Introduction to the Project, Components 3 & 4, and TIMES training

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# Project's Overall Objective and Purpose

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**Project title:** *Technical Assistance for Developed Analytical Basis for Formulating Strategies and Actions towards Low Carbon Development*

*This project is co-financed by the European Union and the Republic of Turkey*

**Overall objective:** To reduce anthropogenic GHG emissions to contribute to the global efforts to mitigate climate change in line with the scientific evidence

**Purpose:** To *increase national and local capacity* to prepare for medium and long term climate action *towards climate resilient low-carbon development*, which will gradually *align with EU climate policy and legislation* by providing an analytical basis to support realisation of low carbon in the long-term, specifically *focusing on cost-effective climate change mitigation actions* related to *building, waste, transportation and agriculture* sectors of the National Climate Change Action Plan (*NCCAP*)

**Period of implementation:** 36 months (June 2017 – May 2020)

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# Project Stakeholders and Target Groups

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- **Ministry of Environment and Urbanisation –Beneficiary**
  - **Central Finance and Contracts Unit (CFCU) - Contracting Authority**
  - **Ministry of Energy and Natural Resources**
  - **Ministry of Food, Agriculture and Livestock**
  - **Ministry of Transport, Maritime Affairs and Communications**
  - **Ministry of Forestry and Water Affairs**
  - **Ministry of Foreign Affairs**
  - **Coordination Board on Climate Change and Air Management**
  - **Turkish Statistical Institute**
  - **Local level governmental institutions**
  - **NGOs and private sector - with focus on the key sectors of buildings, transport, waste and agriculture**
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# Project Consortium



**Consortium Leader - Human Dynamics**, is a leading provider of premium public sector consulting services



**The Regional Environmental Centre for Central and Eastern Europe (REC)** is an international organisation with a mission to assist in addressing environmental issues



**Agriconsulting Europe S.A. (AESAs)**, is a leading international development consulting firm that has been in operation since 1994.

# Carbon intensity – Turkey, EU, World in 2015

<i>Indicators</i>	<b>Turkey</b>	<b>EU</b>	<b>World</b>
Population, million	<u>78,7</u>	<u>509</u>	<u>7334,00</u>
GDP, billion - 2010 \$	<u>859</u>	<u>16335</u>	<u>75489,00</u>
CO2 from fuel combustion, Mt of CO2	<u>317</u>	<u>3340</u>	<u>32294</u>
CO2/pop., t CO2/capita	4,03	6,56	4,40
CO2/GDP, kg CO2/2010 \$	0,37	0,20	0,43
Change in GHG emissions 1990-2015, %	<u>122,00</u>	<u>-23,65</u>	<u>57.40</u>
GHG average annual growth rates 1990-2015, %	<u>3,24</u>	<u>-1,07</u>	<u>1.83</u>

Sources: TURKSTAT, World Bank, IEA, Eurostat, UNFCCC

# Expected results and project components

- **Result/Component 1:** Review of existing strategies in relation to Climate Change
- **Result/Component 2:** Preparation of regulatory and sectoral impact assessments for EU climate acquis
- **Result/Component 3:** Determination of the costs and emission mitigation potential of the actions specified in NCCAP within the **buildings, waste, transport and agriculture sectors**
- **Result /Component 4:** Developing analytical basis for possible strategies and actions ensuring green growth in the long term

# Component 1 *Stock taking and assessment of existing climate related policy, legislative and institutional framework (1)*

ACTIVITY, REPORT	CONTENT
<p><b>Activity 1.1.1</b> Review and analysis of the status of the climate related strategies policies, plans, and legislation (Status Report, 105 p.)</p>	<ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ GHG Emission for Turkey: Trends and Projections</li> <li>▪ Setting Macroeconomic Outlook for Predefined Term (2053)</li> <li>▪ Review of Existing Turkish Legal and Political Framework on Climate Action and Low Carbon Development</li> <li>▪ Conclusions, Recommendations and Inputs for Further Analysis</li> </ul>
<p><b>Activity 1.1.2</b> Identification of the sectoral development policies intended to meet the GHG emissions reduction targets (Demand Status Report, 91 p.)</p>	<ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Development Policies and GHG Emission Reduction Targets in Buildings Sector</li> <li>▪ Development Policies and GHG Emission Reduction Targets in Waste Sector</li> <li>▪ Development Policies and GHG Emission Reduction Targets in Transportation Sector</li> <li>▪ Development Policies and GHG Emission Reduction Targets in Agriculture Sector</li> <li>▪ Conclusions and Recommendations</li> </ul>
<p><b>Activity 1.2</b> Legislative and institutional gap analysis to improve low carbon development and climate change mitigation performance (Gap Analysis Report, 133 p.)</p>	<ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Legal Framework for Low Carbon Development</li> <li>▪ Political and Legislative Gap Analysis</li> <li>▪ Governance and Institutional Framework for Low Carbon Development</li> <li>▪ Conclusions and Recommendations</li> </ul>

# Component 1 *Stock taking and assessment of existing climate related policy, legislative and institutional framework (2)*

<p><b>Activity 1.3</b> Identification and analysis of the political, financial, institutional and technological barriers and opportunities for low carbon development (Barriers and Opportunities Report, 143 p.)</p>	<ul style="list-style-type: none"><li>▪ Introduction</li><li>▪ Analysis of Cross-cutting Barriers and Opportunities in Turkey</li><li>▪ Analysis of Barriers and Opportunities in Buildings Sector</li><li>▪ Analysis of Barriers and Opportunities in Waste Sector</li><li>▪ Analysis of Barriers and Opportunities in Transportation Sector</li><li>▪ Analysis of Barriers and Opportunities in Agriculture Sector</li><li>▪ Conclusions and Recommendations</li></ul>
<p><b>Activity 1.1-1.3</b> Four summarised and collated reports (Consolidated Baseline Report, 161 p.)</p>	<ul style="list-style-type: none"><li>▪ Executive Summary</li><li>▪ Introduction</li><li>▪ Status Report – Review of Existing Strategies Related to Climate Change</li><li>▪ Demand Status Report - Review of the Sectoral Development Objectives and Policies in Relation to GHG Emission Reduction Commitments for Agriculture, Buildings, Transport, and Waste Sectors</li><li>▪ Gap Analysis Report – Identification and Assessment of the Political, Legislative, Institutional and Governance Gaps towards LCD</li><li>▪ Barriers and Opportunities Report – Identifying and Analysing the Problems, Lock-ins and Solutions towards LCD</li><li>▪ Conclusion</li></ul>

The reports can be downloaded from the project's website:  
<http://www.lowcarbonturkey.org/technical-reports/>



## **Component 3: Determination of the costs and emission mitigation potentials of the actions specified within the buildings, waste, transport and agriculture sectors of the NCCAP and other policy documents**

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**Activity 3.1** Assess the GHG emission mitigation potentials of at least ten actions in the selected economic sectors

**Activity 3.2** Assess the financial costs and benefits of the actions analysed in activity 3.1

**Activity 3.3** Identify and analyse other potential positive and negative non-financial societal gains and losses of the analysed mitigation actions

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## **Component 4: Developing GHG scenarios and carbon mitigation actions and supporting development of key stakeholders**

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**Activity 4.1 Carry out GHG scenario modelling for selected sectors**

**Activity 4.2 Identify carbon mitigation activities entailing significant benefits to Turkey with a perspective to reconcile climate, growth, and energy security in the selected sectors**

**Activity 4.3 Capacity building for key stakeholders (training, coaching and mentoring services, study visits)**

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# Conventional approach to GHG mitigation assessment and forecasting is a decomposition of this super complicated task

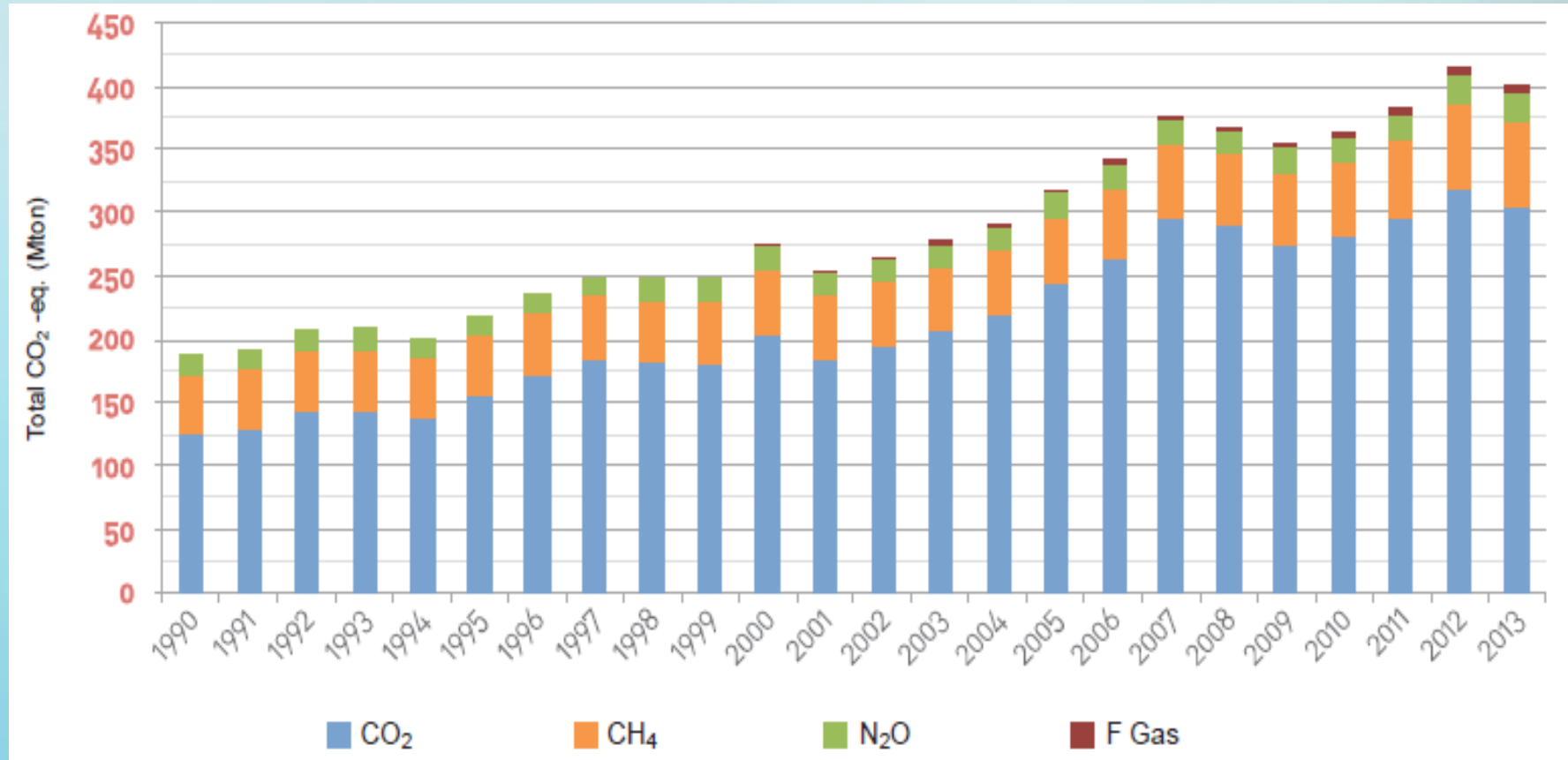
## Decomposition:

- By type of gas
- By sector
- By country/region
- **By emission drivers**
- By policy
- By technology
- Etc.

## Weakness of this approach:

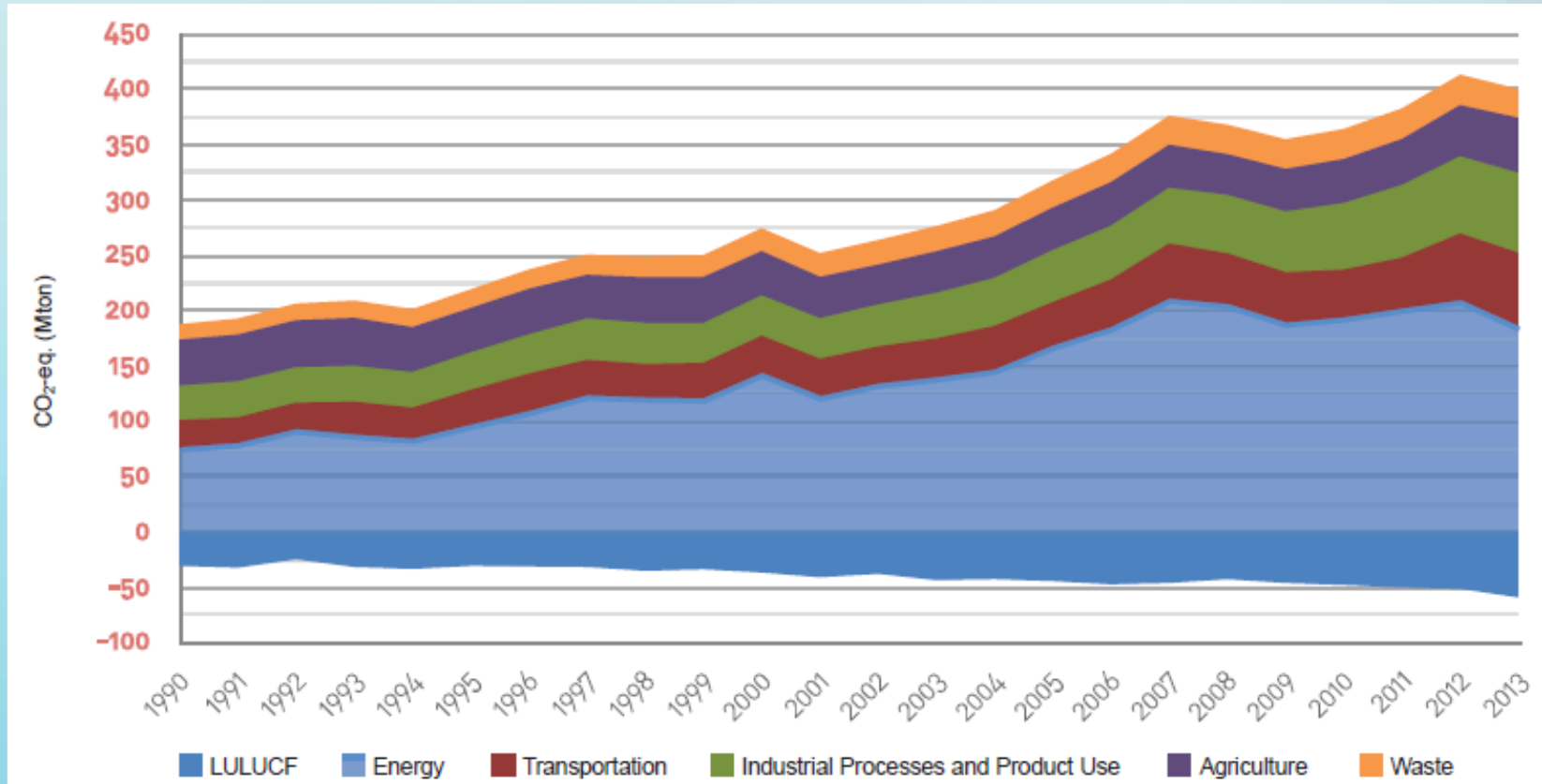
requires very serious assumptions which ignore interlinks and interactions between elements of integral system

# Share of total emissions by greenhouse gas types (Including LULUCF) -1990-2013



Source: SIXTH NATIONAL COMMUNICATION OF TURKEY TO UNFCCC, 2016

# Sectoral greenhouse gas emissions, 1990-2013



Source: SIXTH NATIONAL COMMUNICATION OF TURKEY TO UNFCCC, 2016

# Sectoral GHG emissions in 1990 and 2016

Sector	GHG Emissions (kt CO <sub>2</sub> -eq)		GHG Emissions in total (%)	
	1990	2016	1990	2016
<b>Transport Sector</b>	26968.90	81841.20	12.8	16.5
<b>Buildings Sector</b>	27215.06	56837.30	12.9	11.5
<b>Agriculture Sector</b>	42402.30	56485.70	20.1	11.4
<b>Waste Sector</b>	11090.59	16181.19	5.3	3.3
<b>Total for 4 Sectors</b>	<b>107676.85</b>	<b>211345.39</b>	<b>51.1</b>	<b>42.6</b>

# Carbon emission drivers decomposition – Kaya multiplicative identity (1993)

**CO2 emissions =**

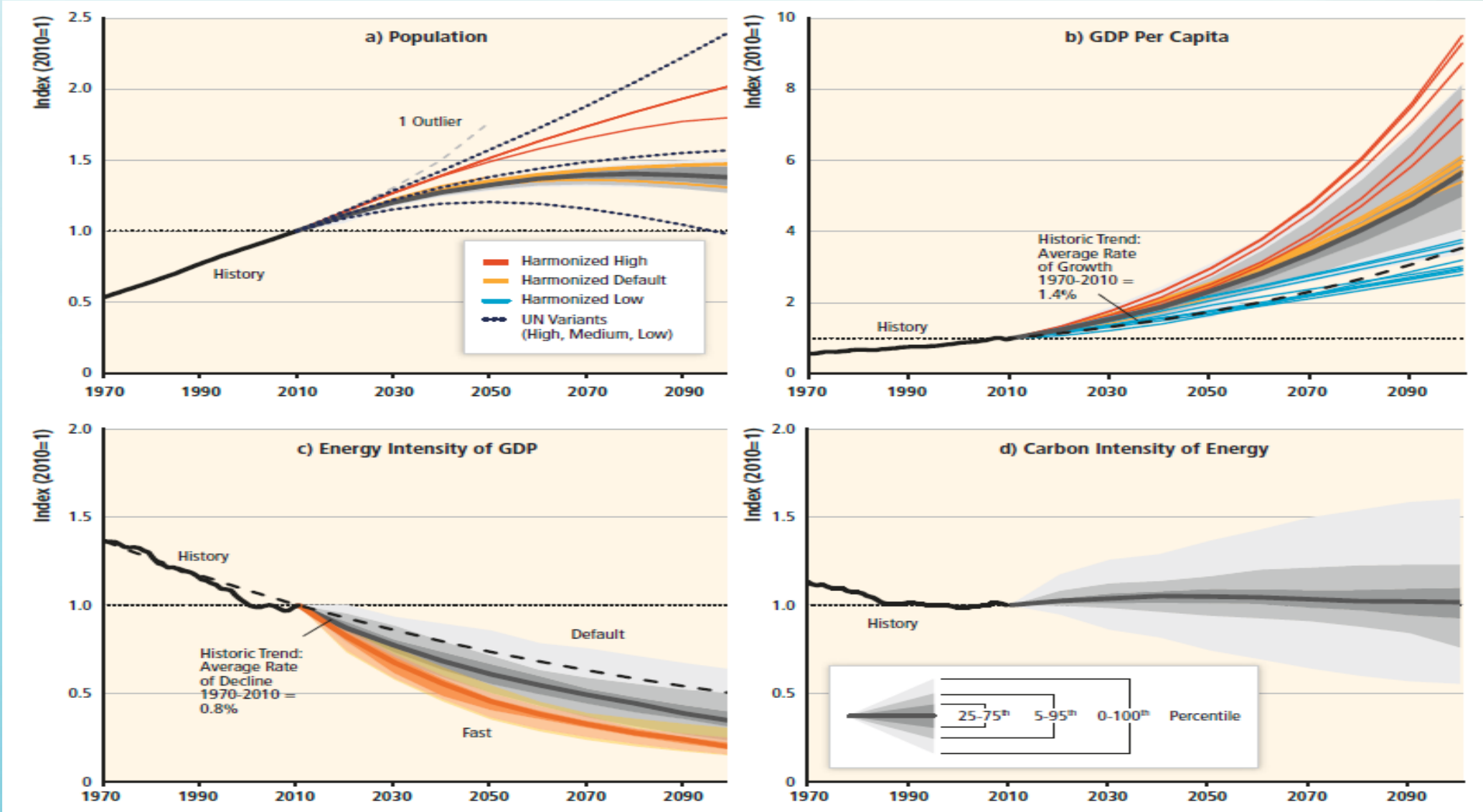
Population x

(GDP/population) x

(TPES/GDP) x

(CO2/TPES)

# Future scenarios for GHG emission drivers



Source: IPCC, WGIII AR5, 2014



# TIMES Modelling Framework as basic tool for sectoral GHG mitigation actions assessment under LCD TR Project

## Why?

### Because TIMES:

- Is integrated multisectoral economic/energy/environmental (GHG) model
- Is applicable at the global, multi-regional, national, state/province, or community level.
- Allows to make long-time projections over a periods of usually 20 to 50 or 100 years
- Is used and tested in 70 countries by 250 institutions
- Has been developed and is well supported by the International Energy Agency's Energy Technology Systems Analysis Programme (MARKAL since 1980 and TIMES since 2000)



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## Thank you for your attention!

<http://www.lowcarbonturkey.org/>

