Energy Futures of Mauritius in a Carbon Constrained World

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Outline of presentation

1. About the Project
2. The methodology – Systems Approach
3. Energy & the Production Function
4. Some Preliminary Results
5. On the way to NAMAs

1 Objectives

Overall: Provide a method for **evidence-based policy decision making**

Specific:

1.Develop a **self-consistent and transparent SD model** that explains the **historical development** of Mauritius, including its GHG emissions;

2.Investigate the emission reduction potential of the actions and measures identified in the **long-term energy strategy**;

3.Construct carbon intensity curves to 2050 based on different GHG stabilization scenarios, while taking into account the projected growths in the economy and population;

4.Identify technologies and investment costs for achieving low-carbon development - **Sectoral Crediting under dynamic baselines**; and

5.Propose a **framework for** developing **Nationally Appropriate Mitigation Actions (NAMAs)**.

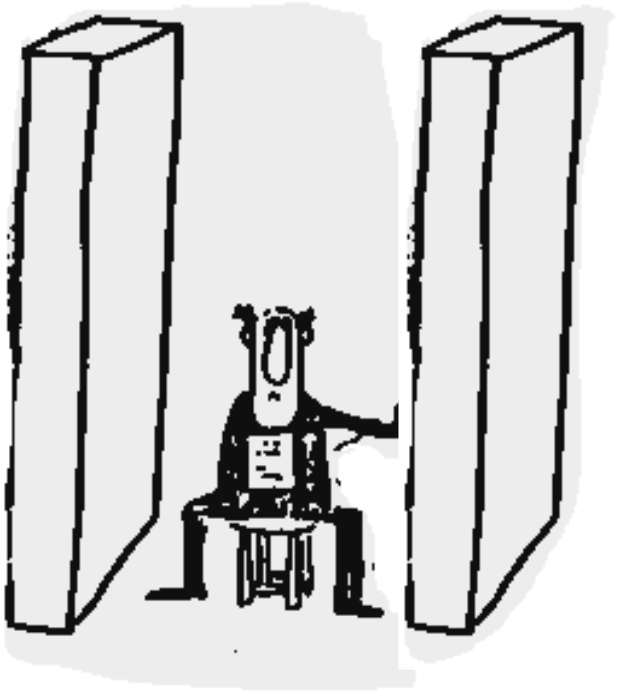
Timelines & Funding

1. Start date: 1 June 2012;
2. Duration: 24 months (i.e. End date – 31 May 2014);
3. Total funding: Rs 593,600.

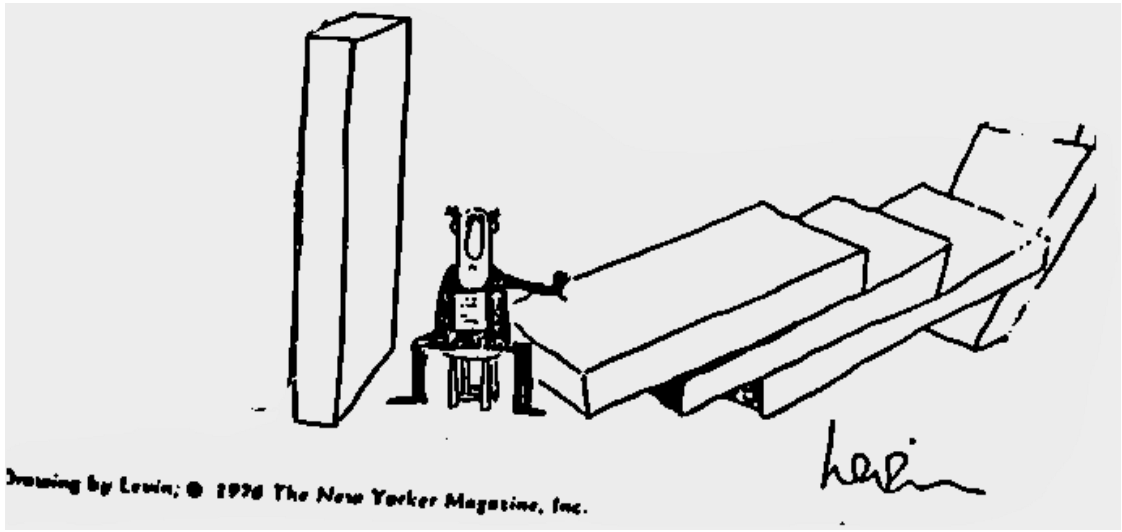
AUTHORS KINDLY ACKNOWLEDGE THE FINANCIAL SUPPORT OF **MRC** (~72% - MRC/RUN-1205) AND **MoESD** (~28% from AAP – MRC/RUN/AAP-1209)

2 Why Take a Systemic View

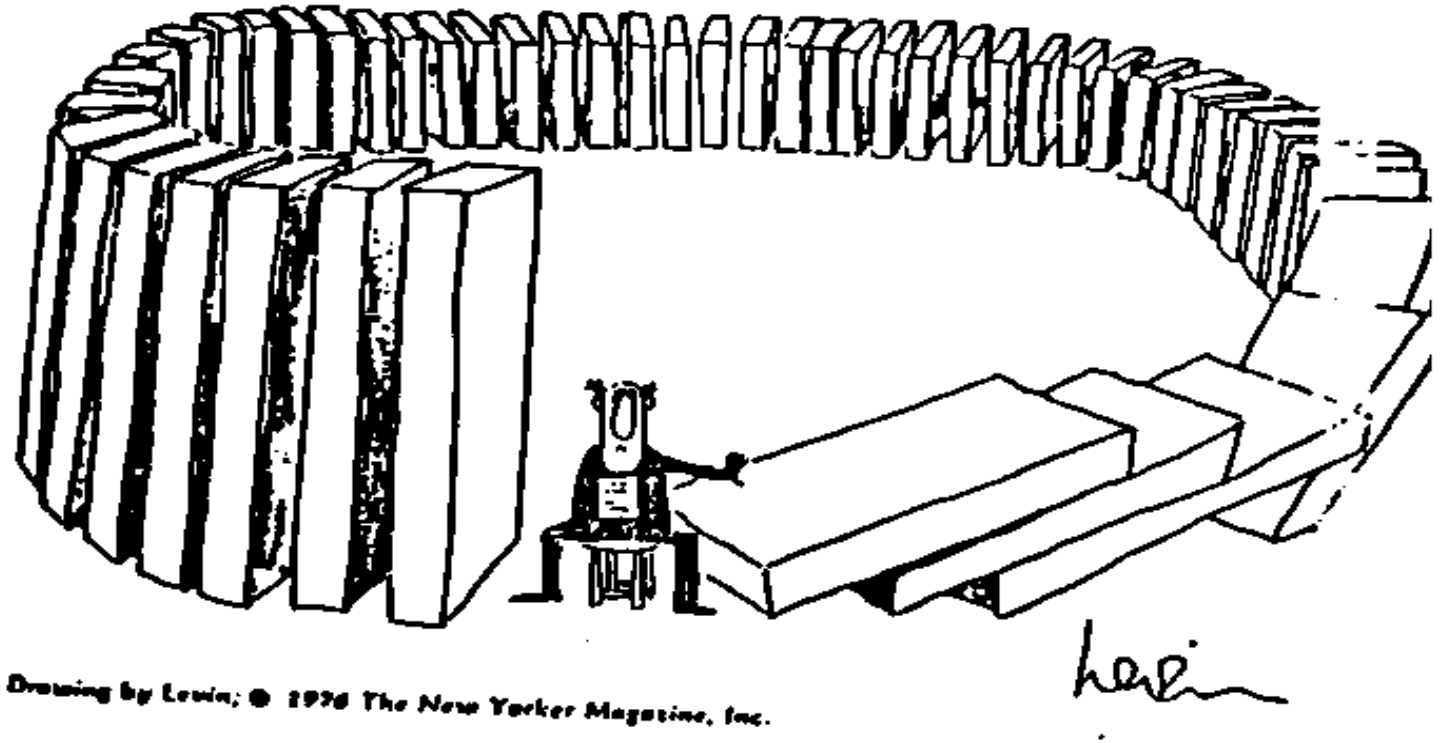
Removing a problem,



may create feedback and delays to .....



To yield unintended consequences!

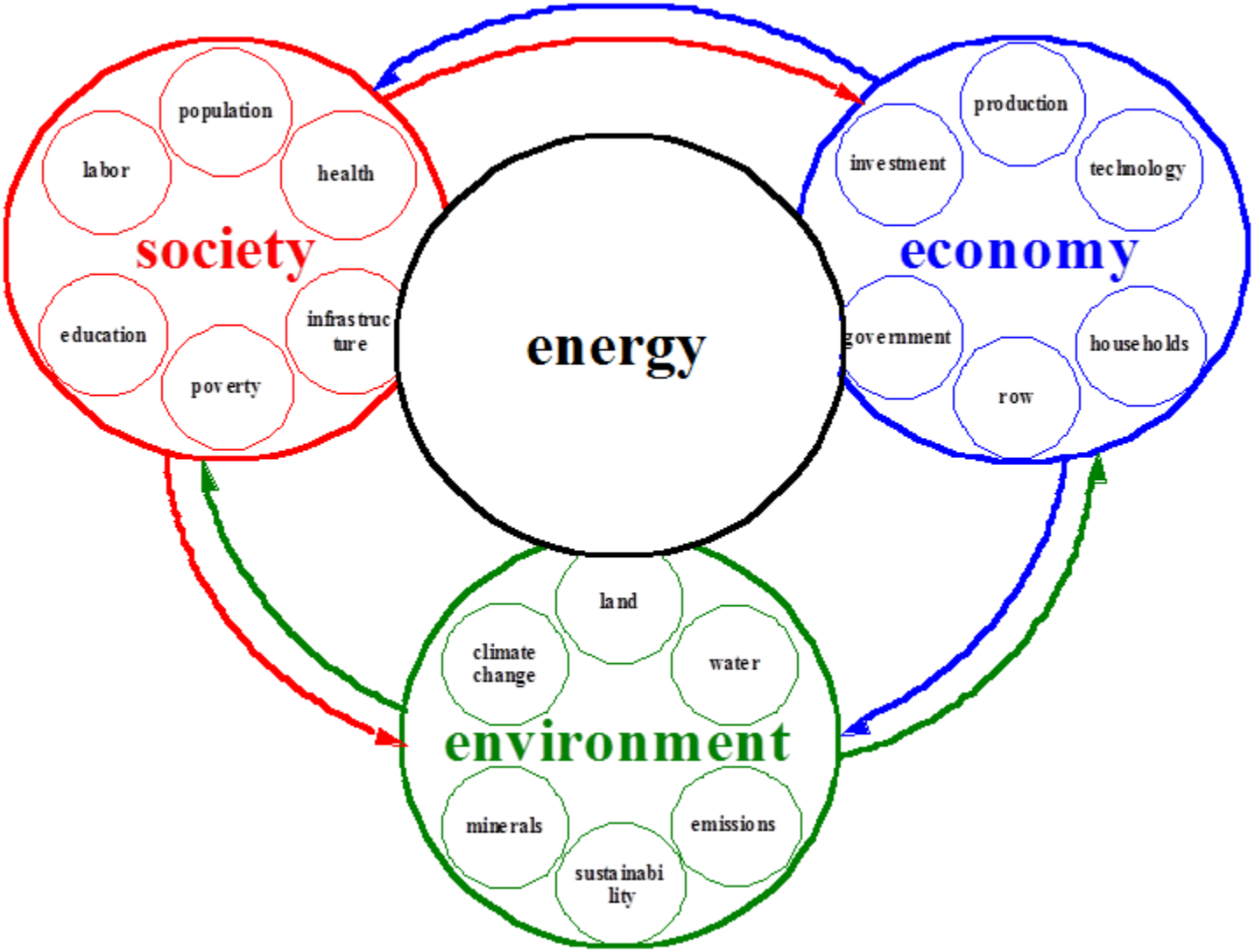


Systems Approach

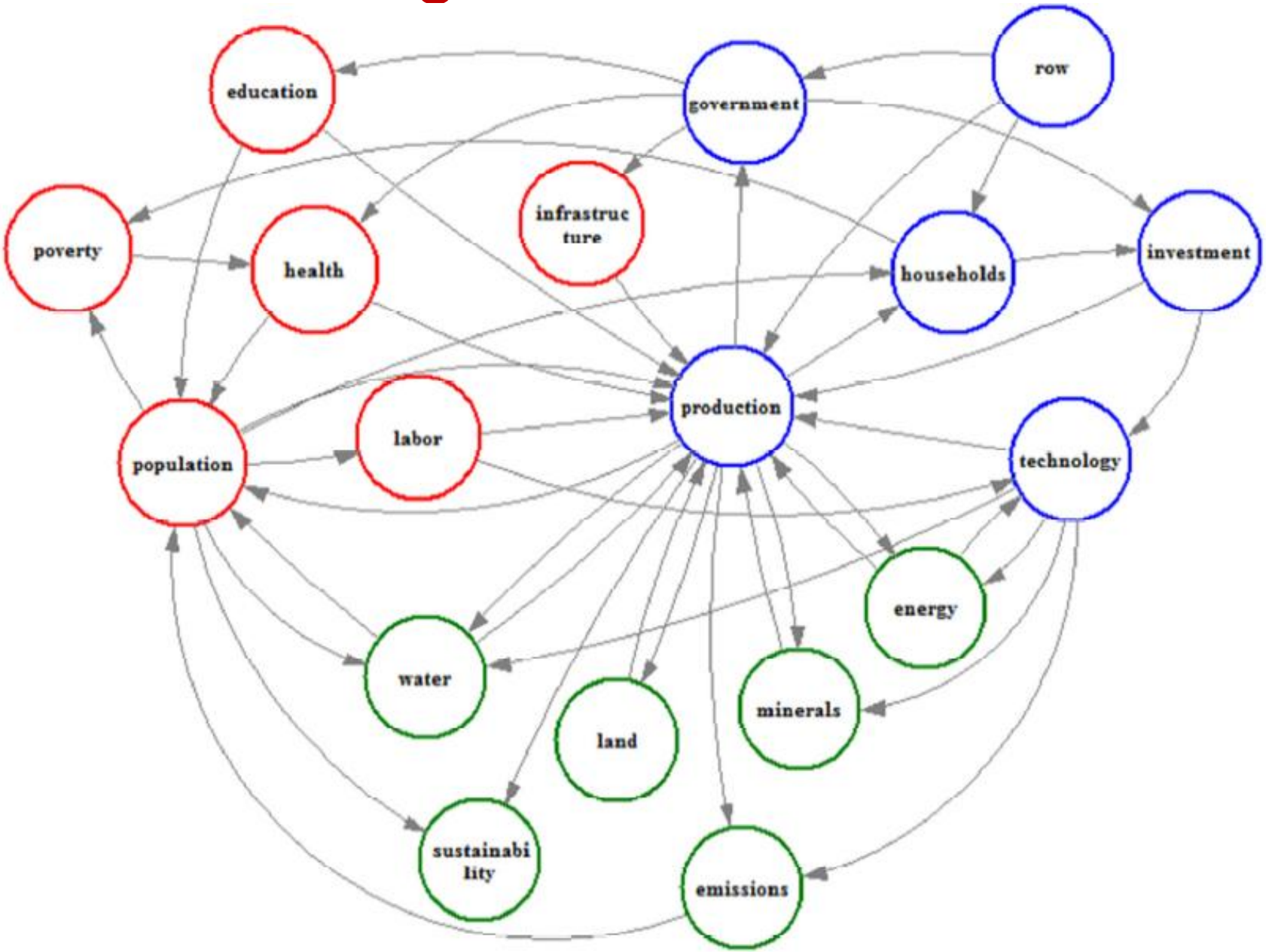
1. Need to understand the structure of a system and all the decision making rules (formal & informal; explicit & implicit) within system;
2. Establish the causal relationships between all variables within the system;

CANNOT BE ACHIEVED USING **MENTAL MODELS** IN A COMPLEX SYSTEM SUCH AS SOCIETY-ECONOMY-ENVIRONMENT

2 Basic Structure of SD Model



Horizontal Integration of Sectors



What does SD Modelling Offer?

- Checks **consistency** and **feasibility** of major objectives and assumptions (e.g. ‘low-carbon’ & ‘climate resilience’; green/blue economy; poverty alleviation; ESTP ….)
- Deepens analysis of policies and programs, **across sectors** and **over time** (reconciliation of different time horizons)
- Informs decision makers of **longer-term implications of policy choices** & better **coordinated decision making**
- Provides **scenarios**, not perfect projections
- Can deal with **uncertainty** and **stochastic processes**
- Allows for easy **monitoring and evaluation** (e.g. Country-specific indicators, MDGs, SDGs, any other …)
- Supports an **evidence-** and **results-based approach** to build resilience

3 Structure of System Dynamics Model

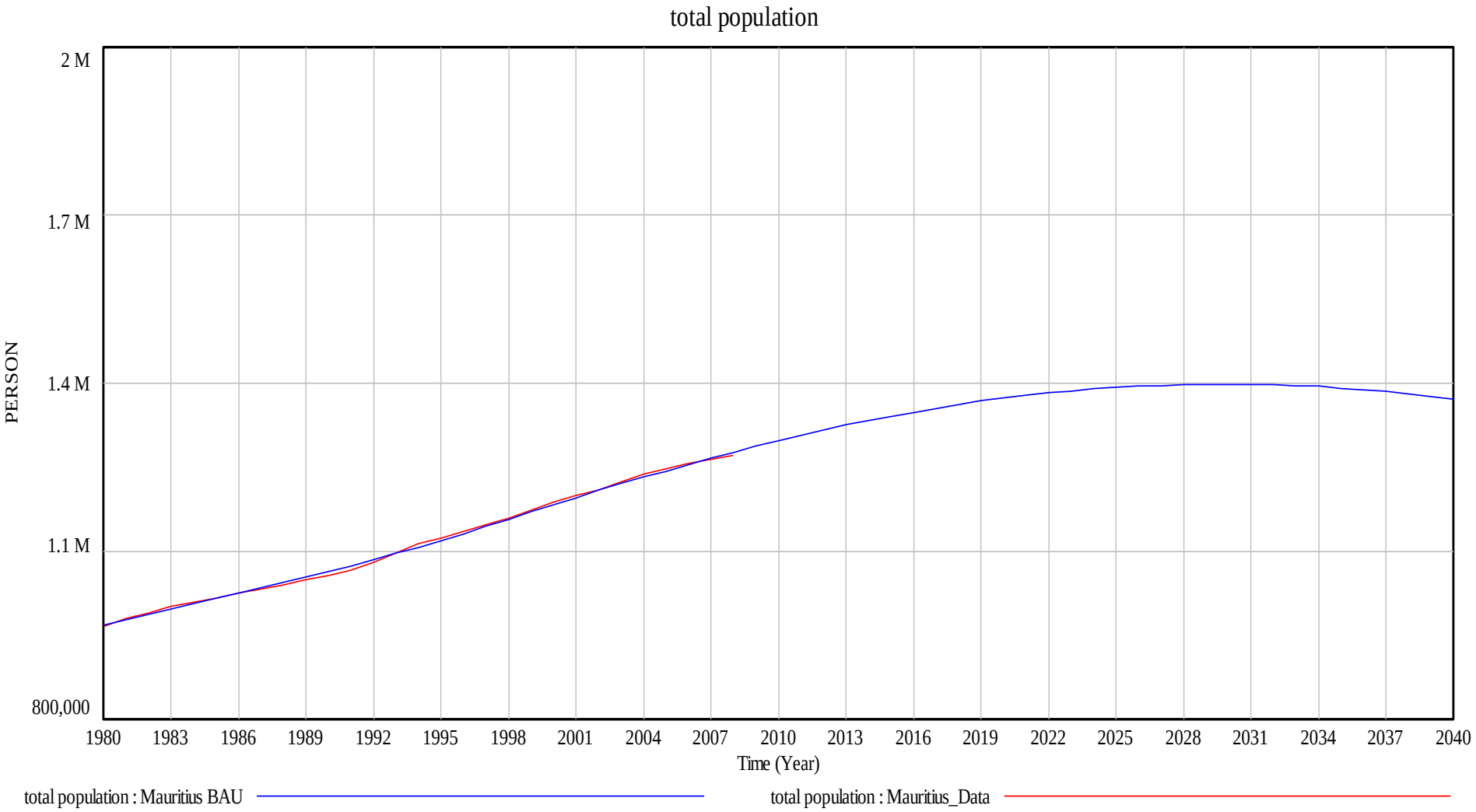
- **Society: 4 modules**
  Population, Education, health care, roads
- **Economy: 5 modules**
  Firms, households, government, banks, energy bill
- **Environment: 3 modules**
  Land, water, air emissions
- **Energy: 22 modules**
  Primary demand, final consumption, power supply, prices, investment, and more…

ENERGY in PRODUCTION FUNCTION

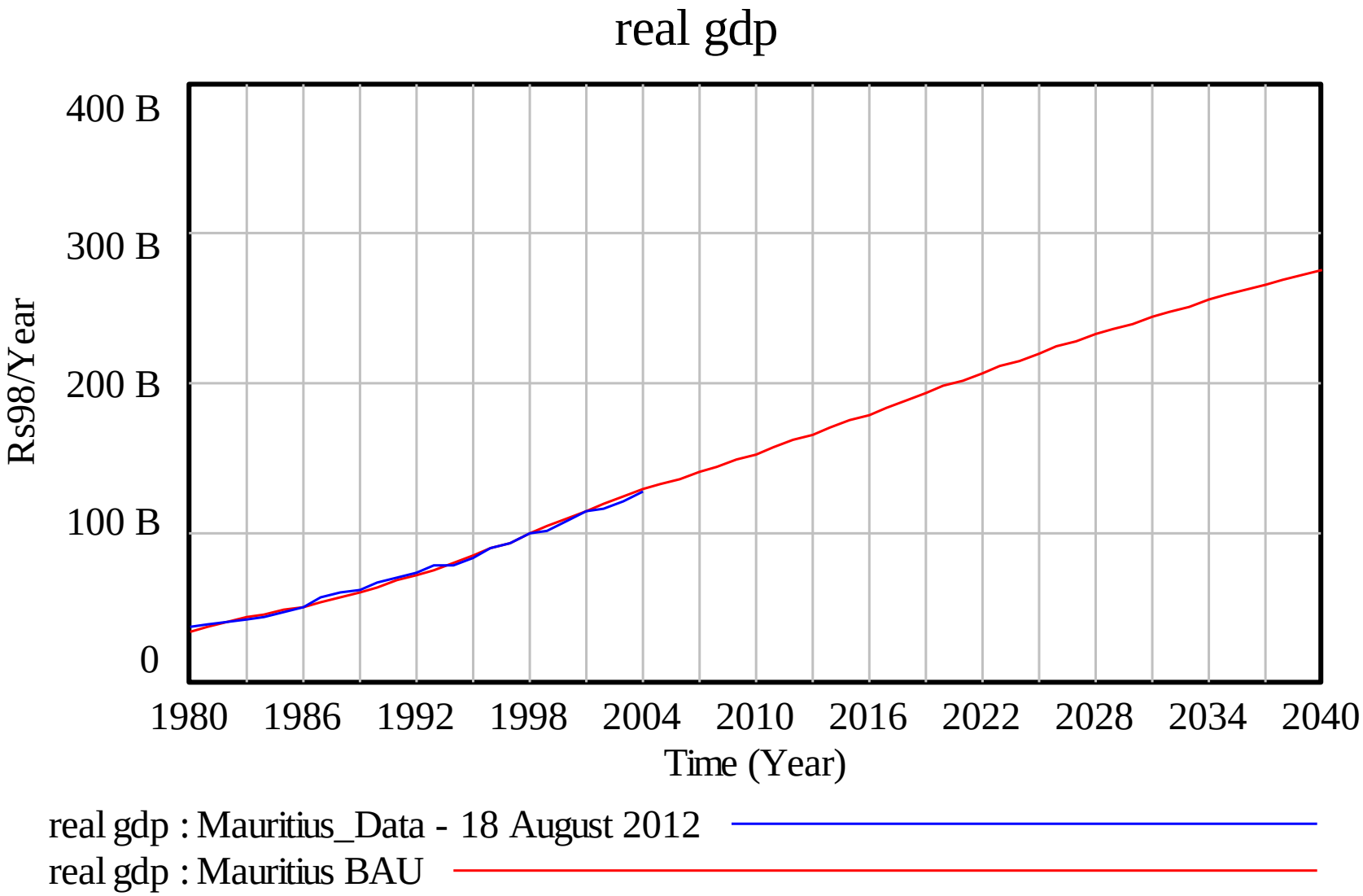
4

Some Preliminary Results

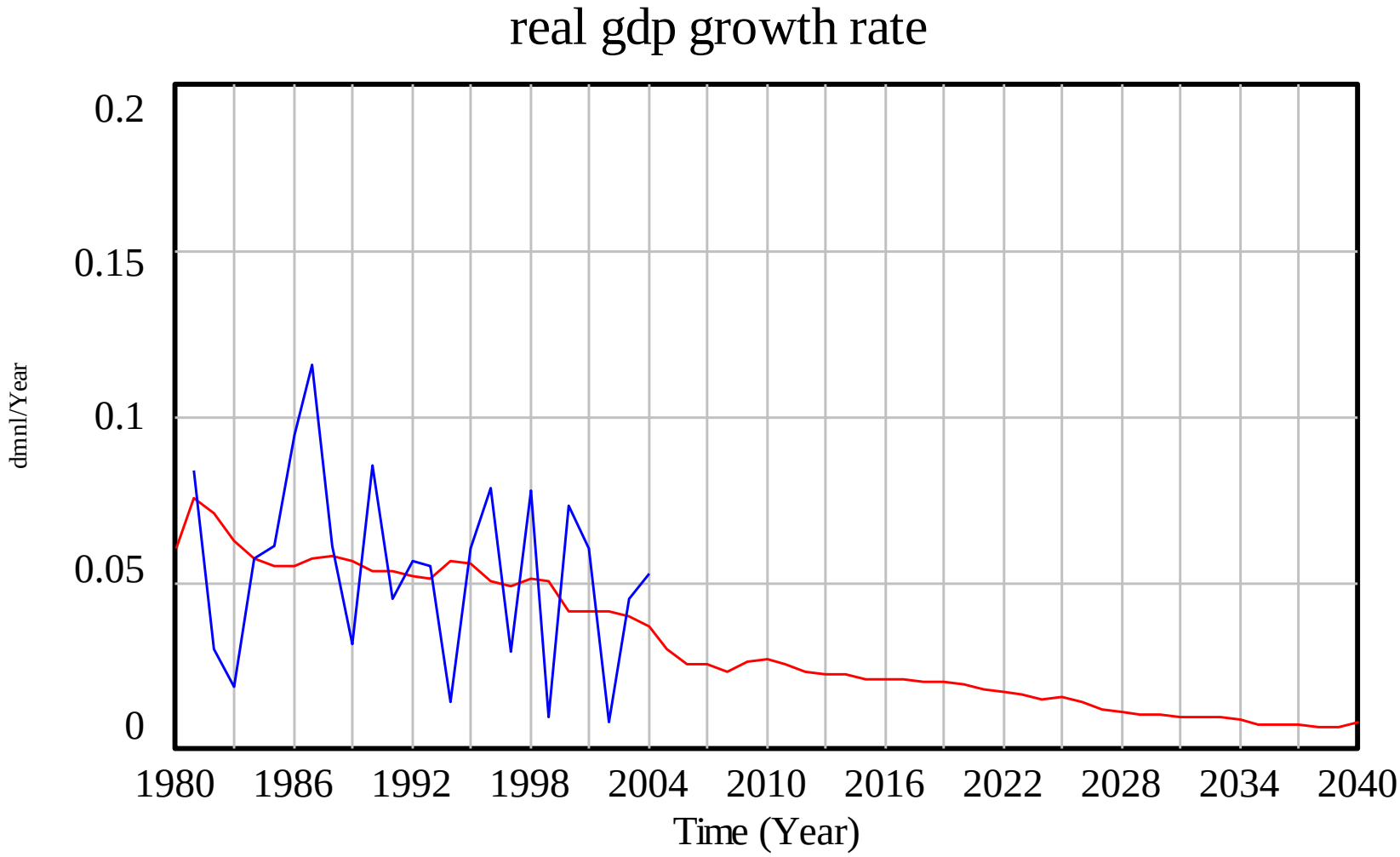
Population


total population
2 M
1.7 M
1.4 M
1.1 M
800,000
PERSON
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
2010
2013
2016
2019
2022
2025
2028
2031
2034
2037
2040
Time (Year)
total population : Mauritius BAU
total population : Mauritius_Data

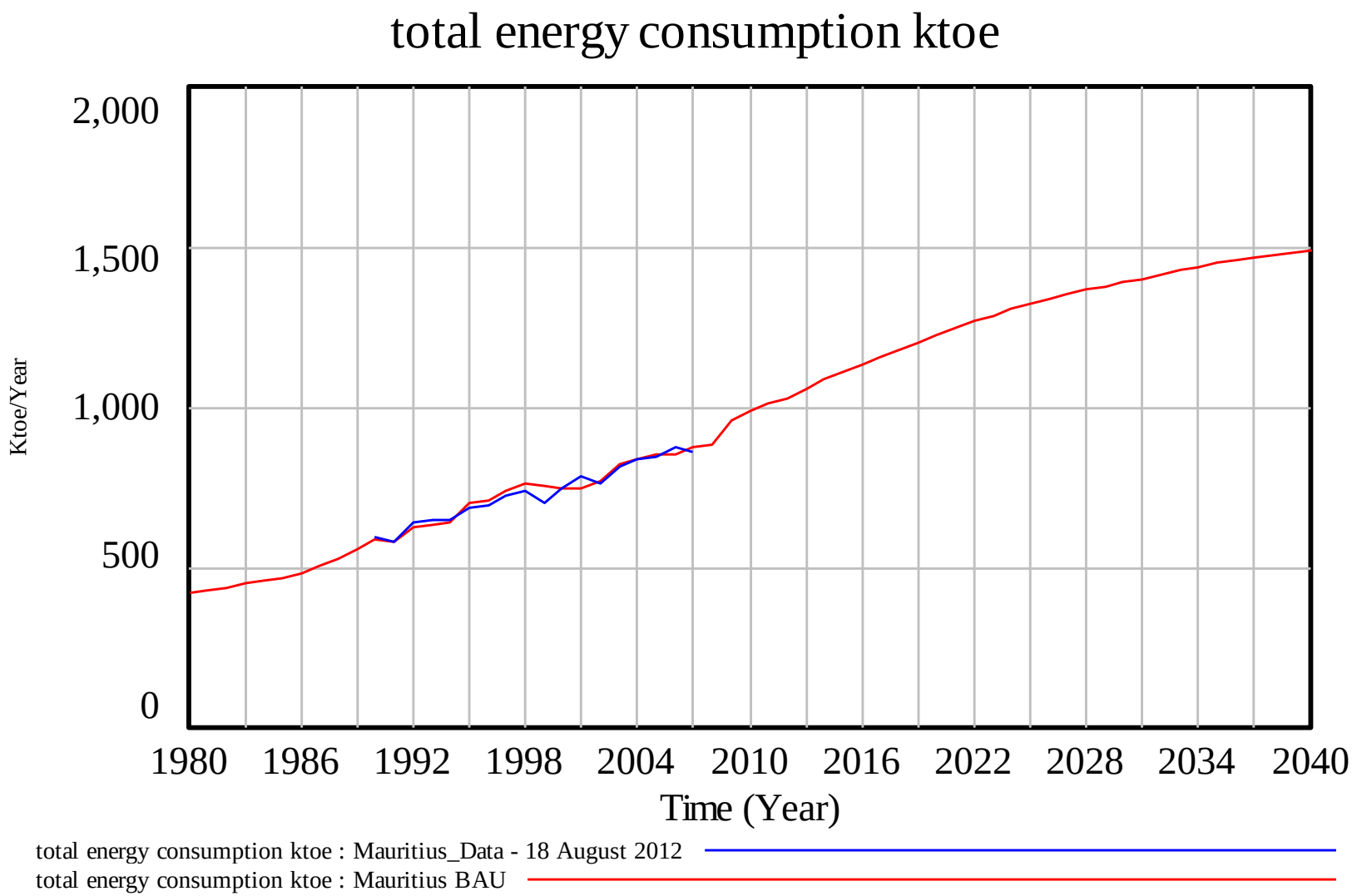
Real GDP


real gdp
400 B
300 B
200 B
100 B
0
Rs98/Year
1980
1986
1992
1998
2004
2010
2016
2022
2028
2034
2040
Time (Year)
real gdp : Mauritius_Data - 18 August 2012
real gdp : Mauritius BAU

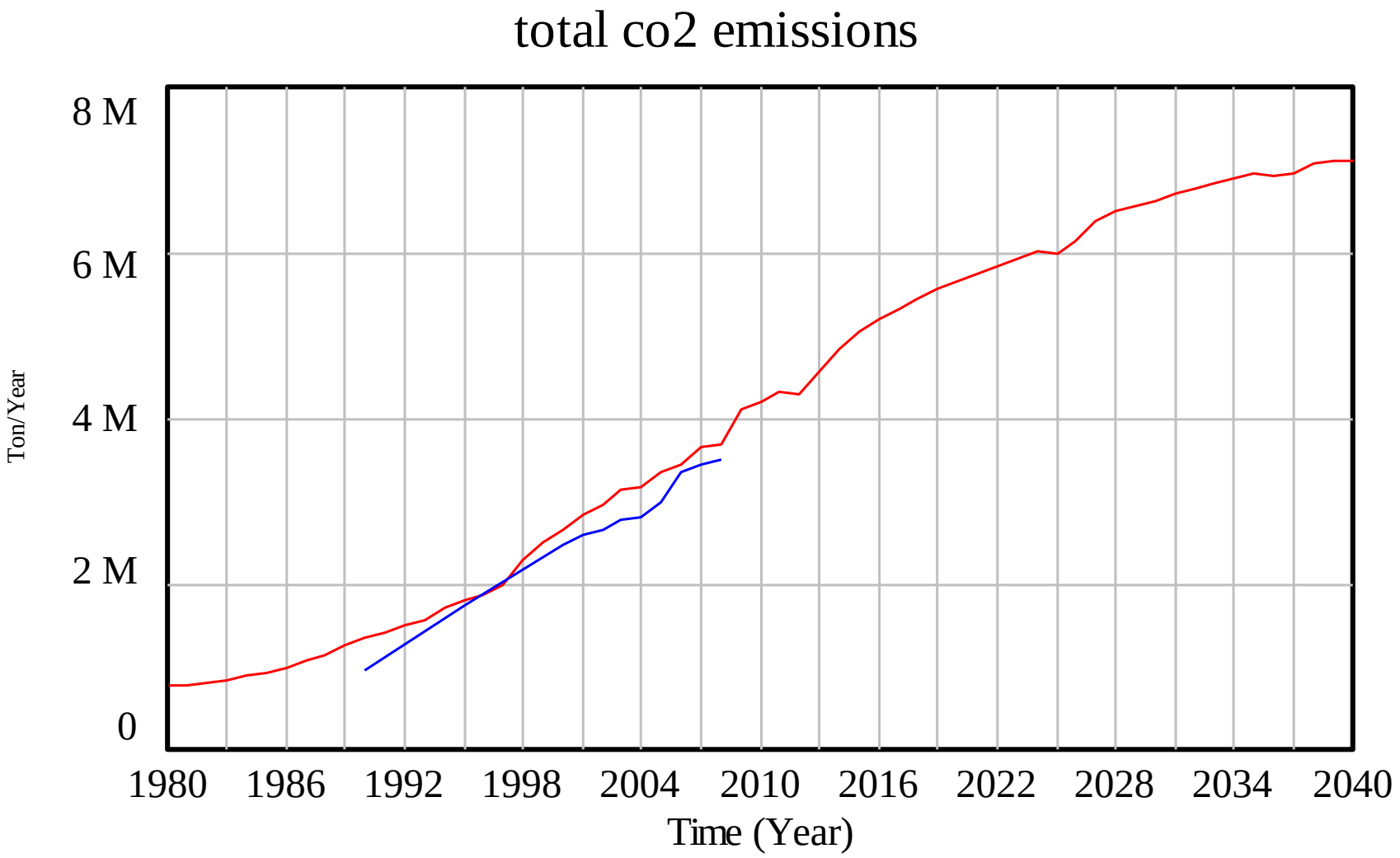
Real GDP growth rate



Total energy consumption (ktoe)



Total CO2 emissions (ton)



5 On the Way to NAMAs

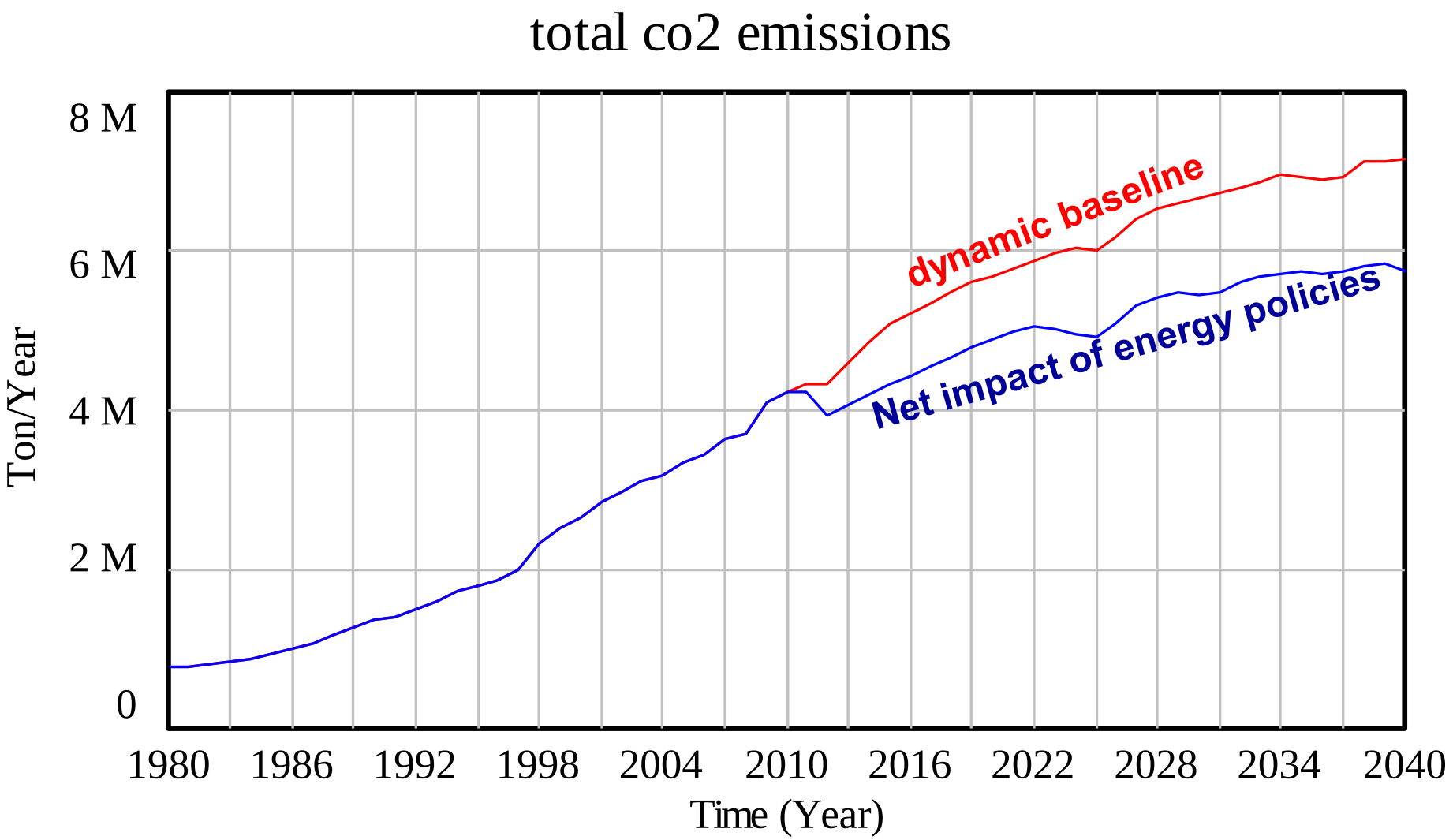
Mauritius & NAMAs

Mauritius has not yet submitted NAMAs, but it has rather communicated officially to the UNFCCC that:

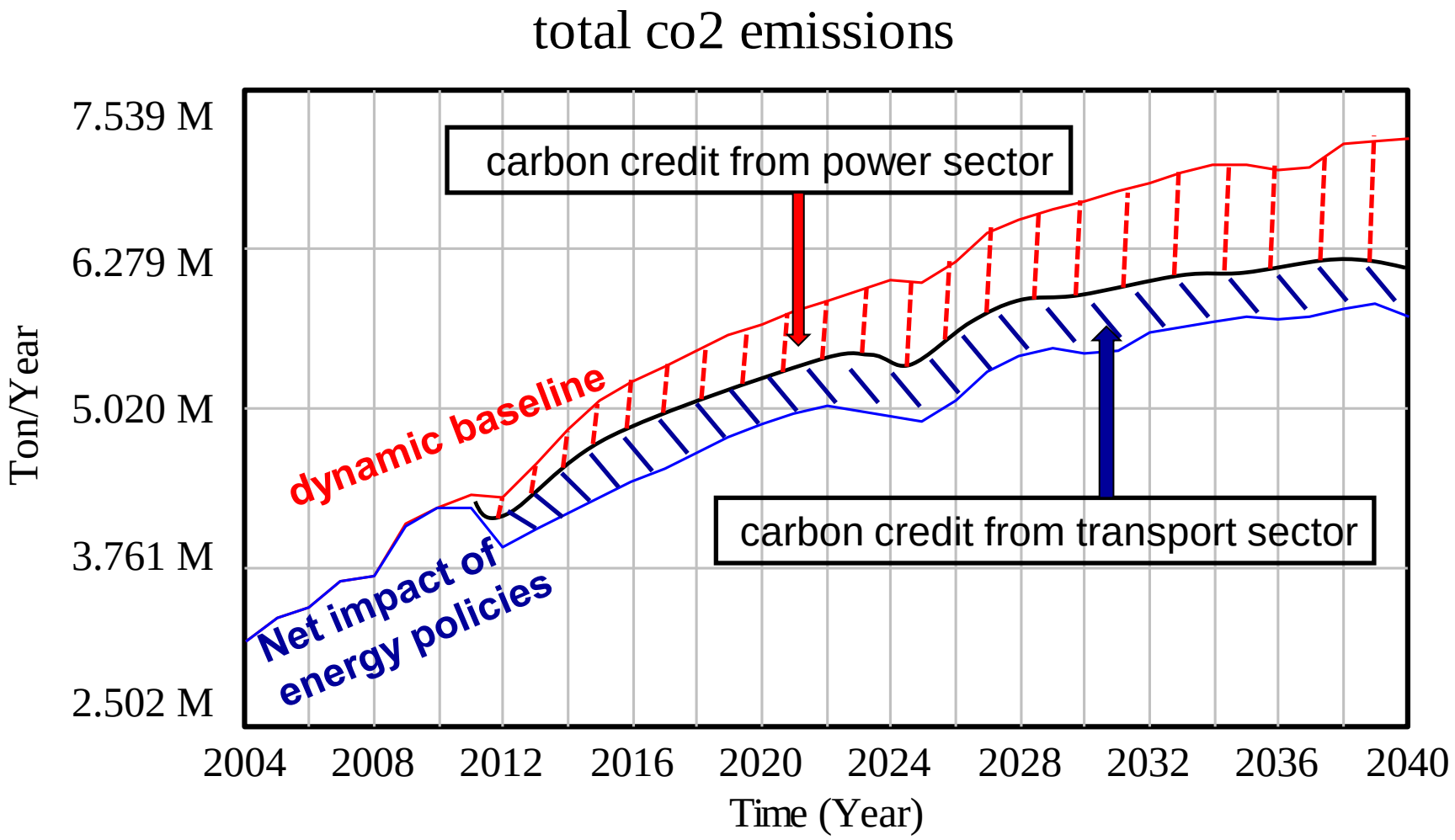
“90. Mauritius communicated that it has already embarked on a comprehensive Sustainable Development Programme as part of the “Maurice Ile Durable” initiative, which prioritizes renewable energy and energy efficiency.
91. Mauritius added that it intends to enhance mitigation efforts subject to the financial, technological and capacity-building support provided.”

Compilation of information on nationally appropriate mitigation actions to be implemented by Parties not included in Annex I to the Convention, Ad Hoc Working Group on Long-term Cooperative Action under the Convention, UNFCCC, Bonn, March 2011.

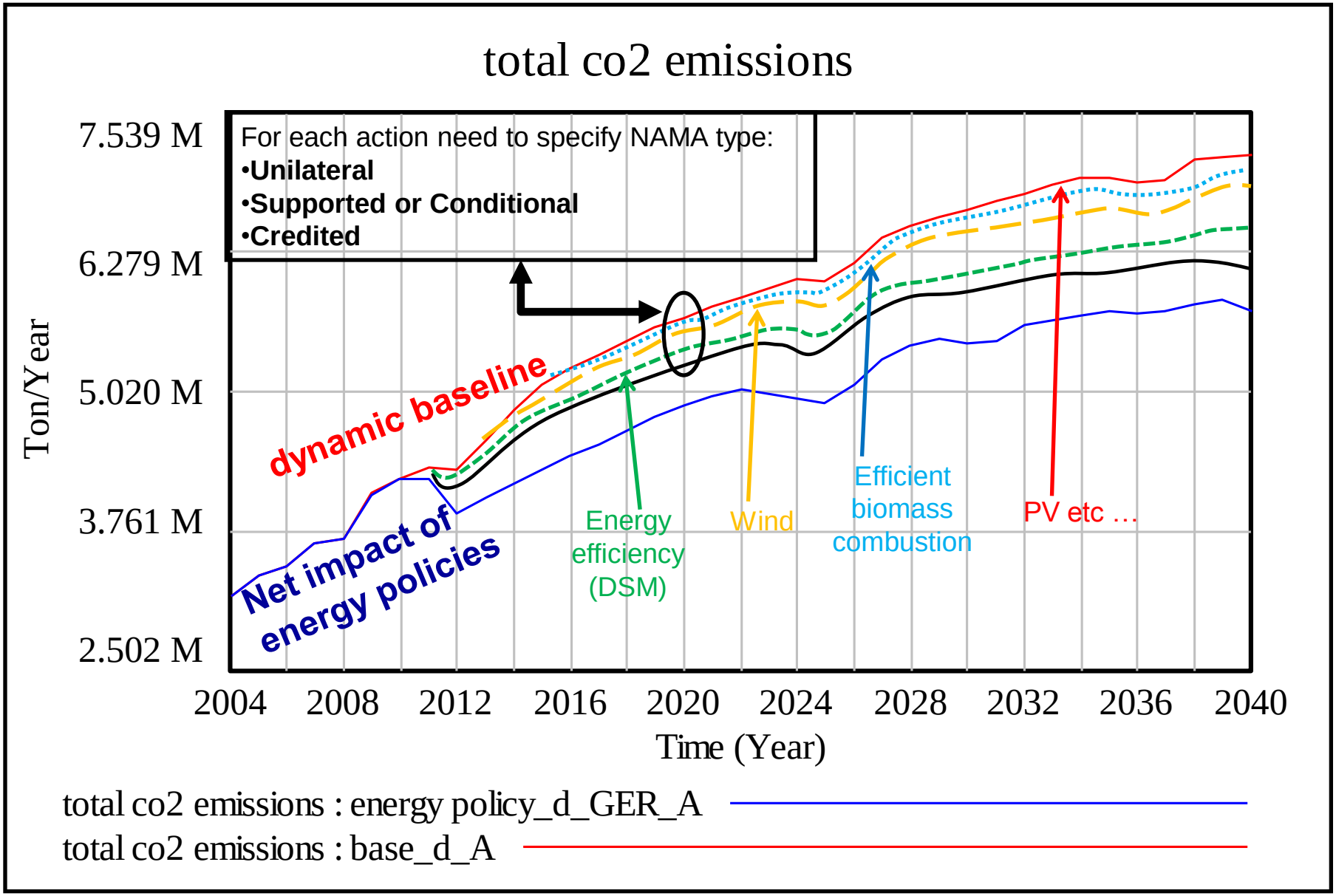
Total CO_2 Emissions (combustion of fossil fuels)



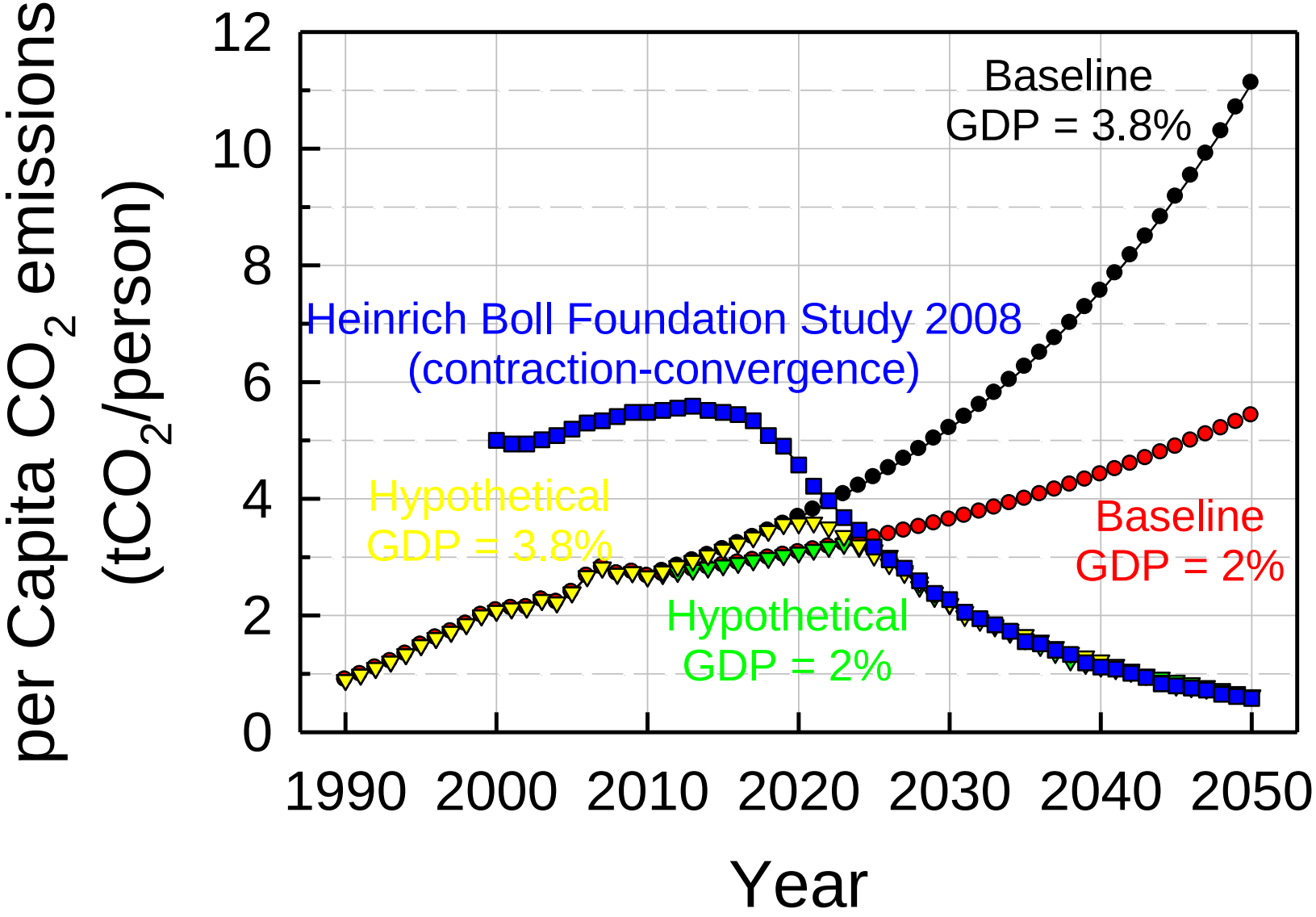
Sectoral Crediting under dynamic baselines



Classifying NAMAs



Energy Futures (low-carbon development pathways for stabilizing temperature rise to 2°C)



ELIA – Ecological Living In Action

Thank You

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