

Inter-Regional Workshop on Experiences and Lessons Learned from
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Global Climate-Land-Energy-Water- Materials-Development Model

An open-source, open data SDG model

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GLOBAL CLIMATE, LAND, ENERGY & WATER STRATEGIES

Water, energy and land-use are intimately interlinked and all affect the climate. Therefore, issues related to water, energy or land use cannot be dealt with in isolation and cannot be met sustainably without trade-offs between them. The CLEWS Model provides an integrated interdisciplinary framework supporting a clear understanding of those relationships.

The original model was developed by researchers from the Royal Institute of Technology (KTH) in Sweden in cooperation with the United Nations Division for Sustainable Development. For more information please visit: [UN DESA](#)

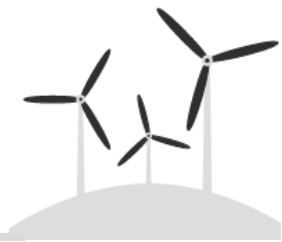
Global CLEWS



Objectives:

- Increase awareness of the need for integrated policy approach to implement national development strategies and achieve sustainable development goals
- Identify and quantify trade-offs and synergies across the wide range of sustainable development issues

Global CLEWS



The model helps exploring questions such as:

- What is the role of nuclear, coal, and biofuels in a sustainable development path?
- What could be the effect of carbon tax on optimal allocation of energy mix? And on water consumption?
- What would be the global cost of different climate mitigation strategies ?

Global CLEWS



Is there a need for yet another global model?

- If the model contributes to the understanding of interrelations between global and national entry points to the 2030 Agenda for sustainable development

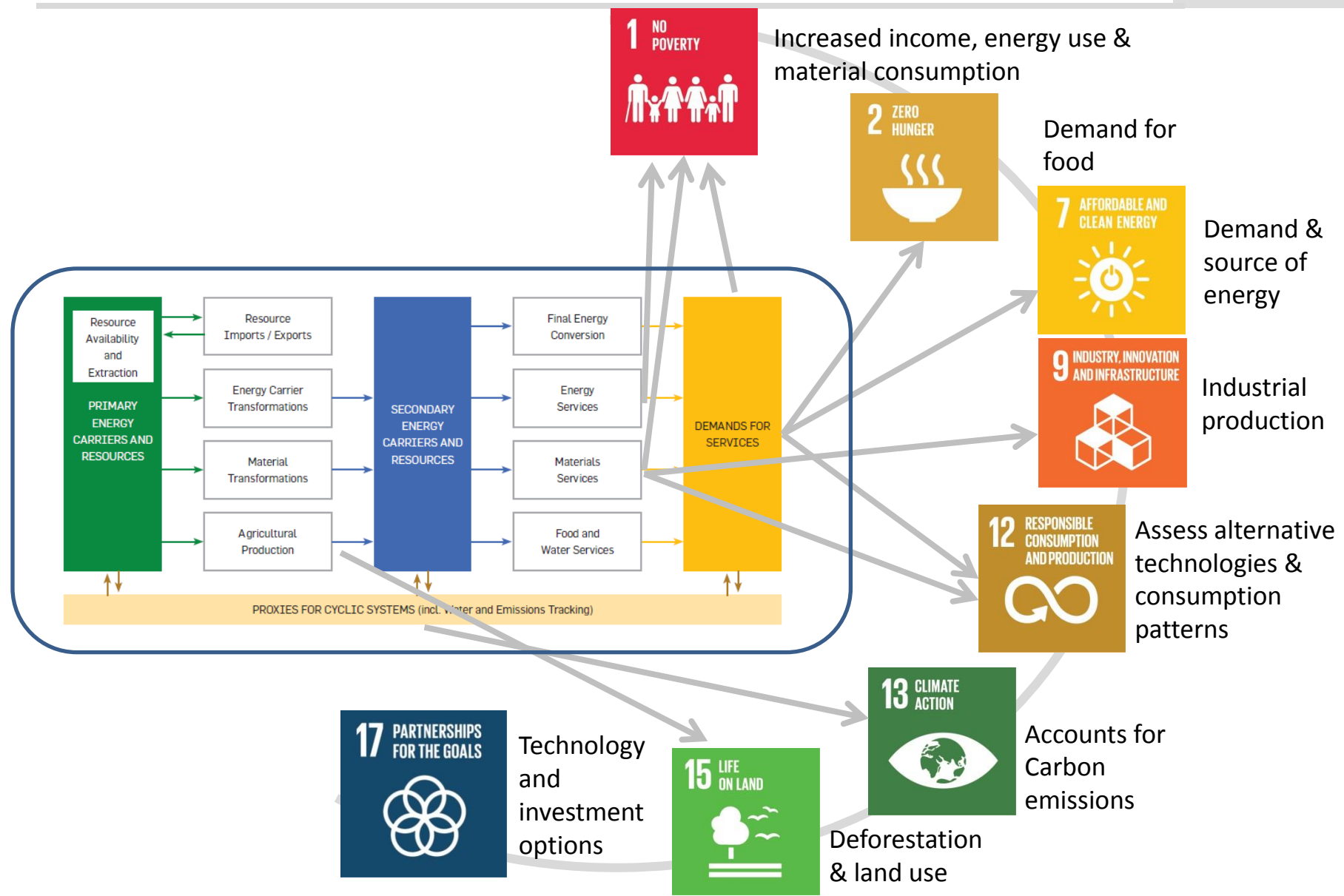
And

- If the model can be transferred to countries and be of use to understand the global context in which national 2030 Agenda policies can be formulated

The answer is **YES**



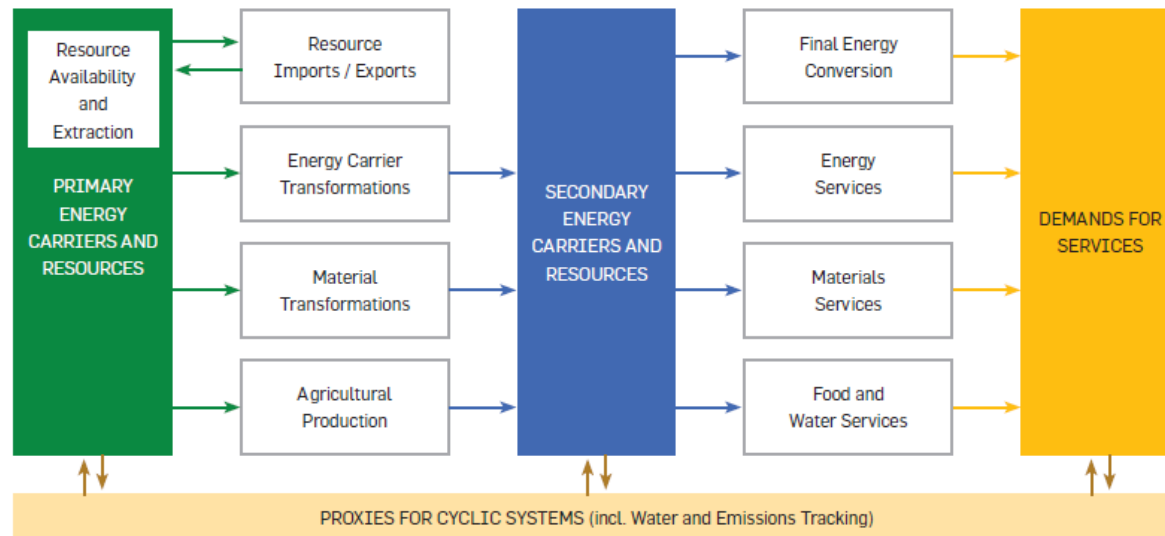
Linking with Agenda 2030 for SD





The model: integrated systems

- **Primary energy sources** (e.g. coal, gas, oil, wind, nuclear, hydro, geo thermal, biomass) are extracted and/or made available and transformed into **secondary energy carriers and resources**
- Energy is used by **households and industries** (e.g. heat, motion, light)
- Land uses energy and water for irrigation and fertilizers to produce food to meet global demand and biomass for energy
- **Industries use energy and materials** to produce cement, aluminum, fertilizers, steel, paper and pulp, and petrochemicals to meet global demand
- Use of **carbon-based fuels** in energy, **land and materials sectors** results in **CO₂ emissions**



Scenarios



Baseline

- This is the **business-as-usual** approach and does not enforce any new environmental regulations. It follows current assumptions for total primary energy supply and renewable energy generation potentials. Greenhouse gas emissions are expected to **increase average temperature to above 4°C**.

4°C scenario

- This scenario assumes a maximum level of fossil fuel use which **limits the increase in average global temperature by up to 4°C**. It follows current assumptions for total primary energy supply and renewable energy generation potentials.

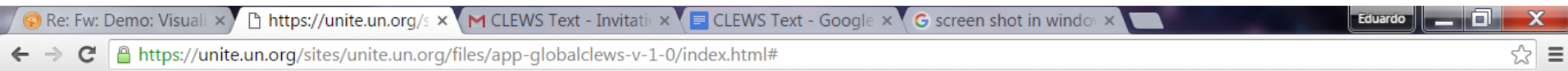
2°C scenario

- This scenario assumes a maximum level of fossil fuel use which **limits the increase in average global temperature by up to 2°C**. It follows current assumptions for total primary energy supply and renewable energy generation potentials.

Carbon tax

- This scenario incorporates a **global carbon tax** linearly rising from US\$1 per ton CO₂ eq. in 2016, to US\$15 in 2030, and to US\$25 in 2050. This case is examined to assess effects on primary energy supply and power generation.

Interactive on-line tool



Welcome to the United Nations

COMPARE CLIMATE SCENARIOS

Use the dropdown menus to compare the emissions and energy produced by various industries under different climate scenarios.



Baseline Scenario ▾

This is the **business-as-usual** approach and does not enforce any new environmental regulations. Greenhouse gas emissions are set to **increase temperature by 6°C**.



Carbon Tax Scenario ▾

This scenario incorporates the imposition of a **global carbon tax**. This case is examined to assess effects on primary energy supply and power generation.



guide

trade-offs

emissions & use

energy supply

💧 How much water is consumed with this plan?

HIGH

3,798 km³

☁ How much CO₂ is produced?

HIGH

2,408 gt CO₂ eq

💰 How much does this plan cost?

LOW

\$255,903

💧 How much water is consumed with this plan?

HIGH

3,849 km³

☁ How much CO₂ is produced?

HIGH

2,230 gt CO₂ eq

💰 How much does this plan cost?

LOW

\$263,253

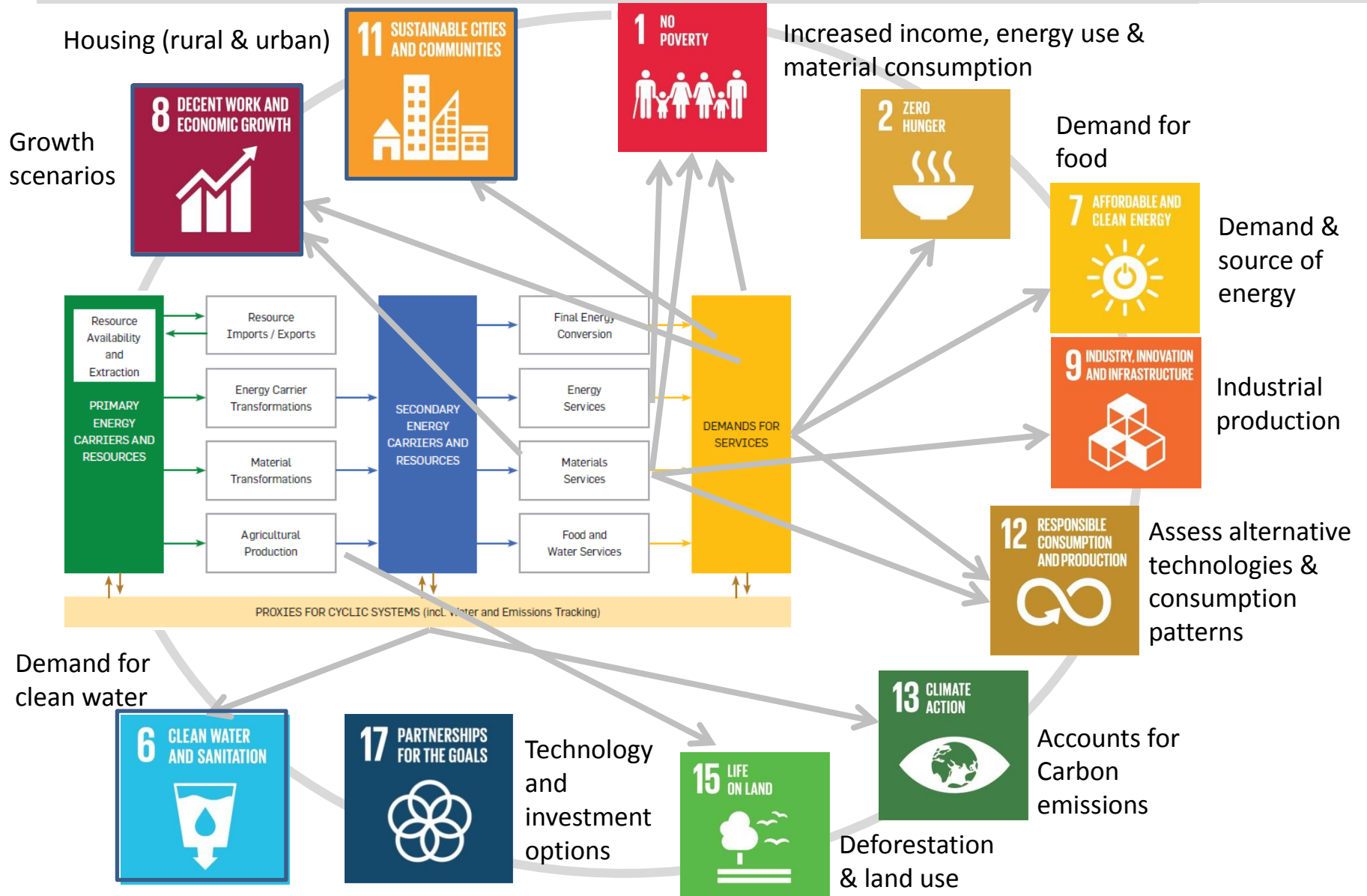
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Developed by UN Department of Economic and Social Affairs in collaboration with the Office of Information and Communications Technology. All scenarios were created using the Osemosys model developed by the Royal Institute of Technology (KTH) in Sweden. [Download the model, data and full results here.](#)





Online and alive: Future extensions



Thank you

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<http://sustainabledevelopment.un.org/globaldreport>

