Connecting climate action with other Sustainable Development Goals

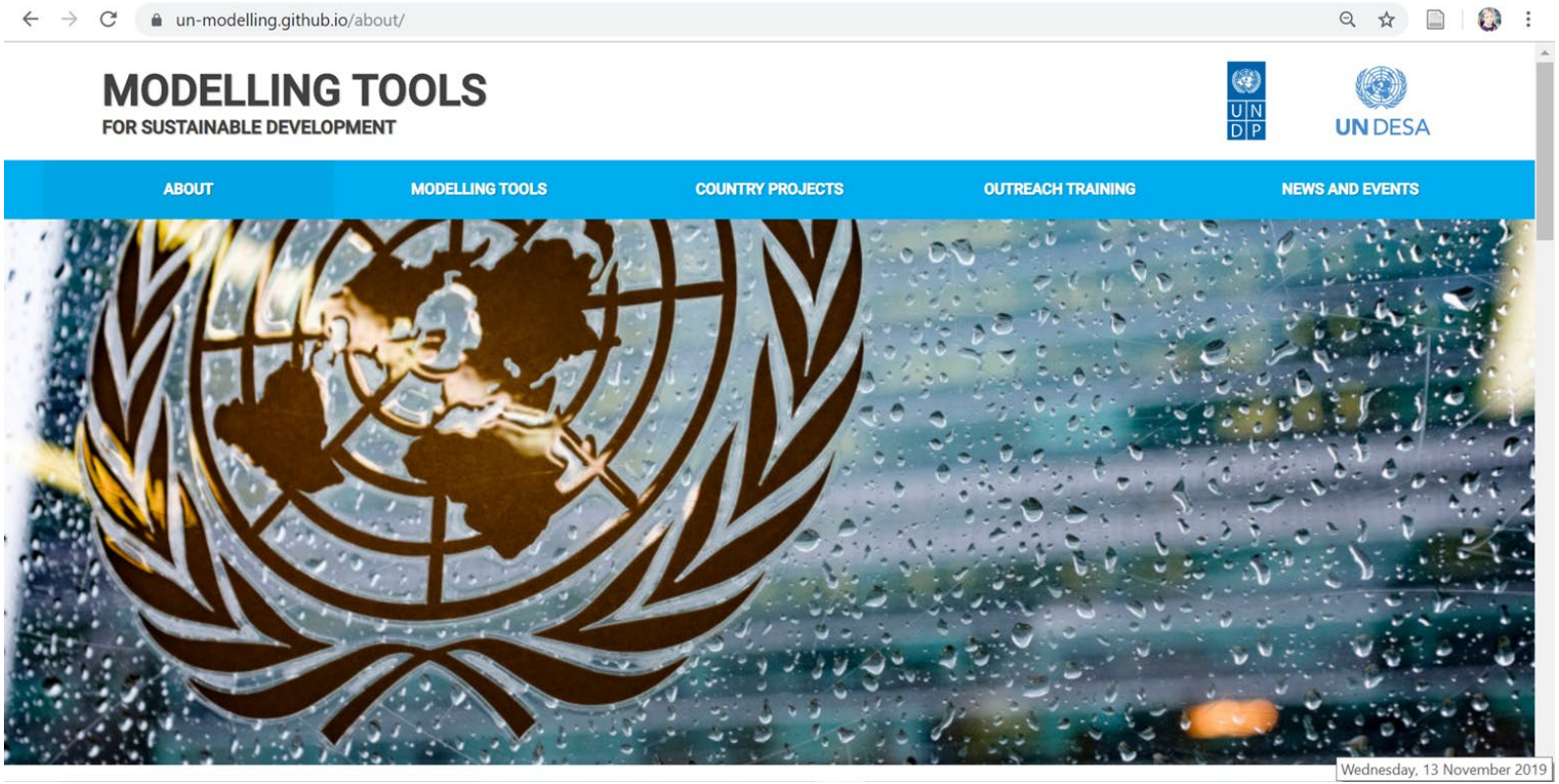
A partnership between KTH and the UN system of organisations

November 14th 2019

Mark Howells, Francesco Gardumi, Francesco Fuso Nerini, Will Usher, Holger Rogner, Morgan Bazilian, Vignesh Sridharan, Abhishek Shivakumar, Oliver Broad, Constantinos Taliotis, Dimitris Mentis, Alexandros Korkovelos, Ioannis Pappis, Eunice Ramos, Rebecka Engstrom, Manuel Welsh, Nandi Moksnes, Shahid Siyal, Babak Kahvari, Andreas Sahlberg, Camilo Ramirez, Agnese Baltrame, Hauke Henke, Georgios Avgerinopoulos & Gabriela Pena.

Division of Energy Systems Analysis, Department of Energy Technology
School of Industrial Technology and Management, KTH Royal Institute of Technology

Modelling Tools for Sustainable Development



Modelling Tools for Sustainable Development

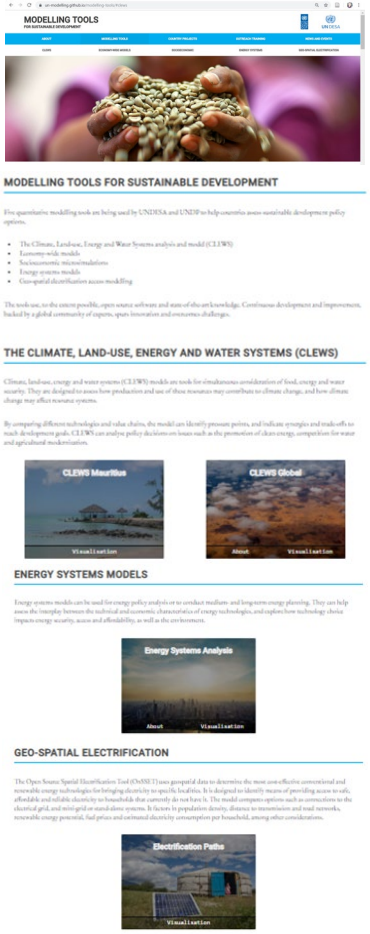
PARTNERSHIPS

UNDESA and UNDP work with key research partners including: the Universidad de La Plata (Argentina), the Royal Institute of Technology in Sweden (KTH-dESA), the International Atomic Energy Agency (IAEA), the International Institute for Applied Systems Analysis (IIASA), the Stockholm Environment Institute (SEI-US), the International Centre for Theoretical Physics (ICTP-Italy), the Policy Centre (IPC IG, Brazil), the University of Cambridge (United Kingdom) and the British Colombia Institute of Technology (Canada)

UN DESA
United Nations Department of Economic and Social Affairs

UNDP
United Nations Development Programme

KTH VETENSKAP OCH KONST
Royal Institute of Technology



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Francesco Fuso Nerini, Benjamin Sovacool, Nick Hughes, Laura Cozzi, Ellie Cosgrave, Mark Howells, Massimo Tavoni, Julia Tomei, Hisham Zerriffi & Ben Milligan

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Integrated analysis of climate change, land-use, energy and water strategies

Mark Howells, Sebastian Hermann, Manuel Welsch, Morgan Bazilian, Rebecka Segerström, Thomas Alfstad, Dolf Gielen, Holger Rogner, Guenther Fischer, Harrij van Velthuizen, David Wiberg, Charles Young, R. Alexander Roehrl, Alexander Mueller, Pasquale Steduto & Indoomatee Ramma

Nature Climate Change **3**, 621–626 (2013) | Download Citation

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Vignesh Sridharan, Oliver Broad, Abhishek Shivakumar, Mark Howells, Brent Boehlert, David G. Groves, H-Holger Rogner, Constantinos Taliotis, James E.

Bringing electricity to the World

worldbank.org/en/news/press-release/2017/07/20/new-open-source-tool-a-breakthrough-in-electrification-planning

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PRESS RELEASE | JULY 20, 2017

New Open Source Tool a "Breakthrough" in Electrification Planning

July 20, 2017 – Governments and others planning how to reach more households with electricity have a powerful, new open source tool that estimates the optimal way to do so, now available on the recently launched ENERGYDATA.INFO.

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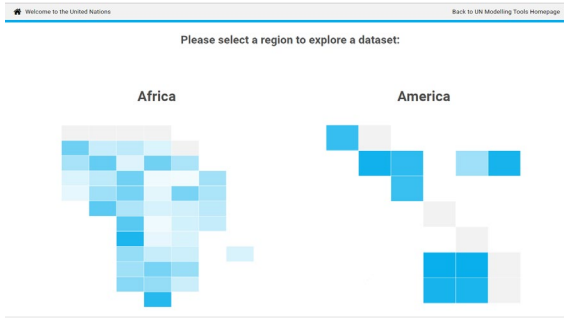
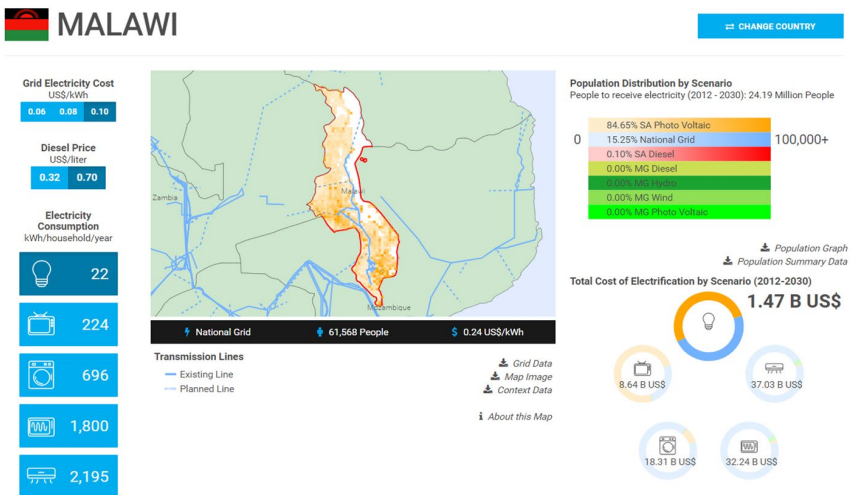
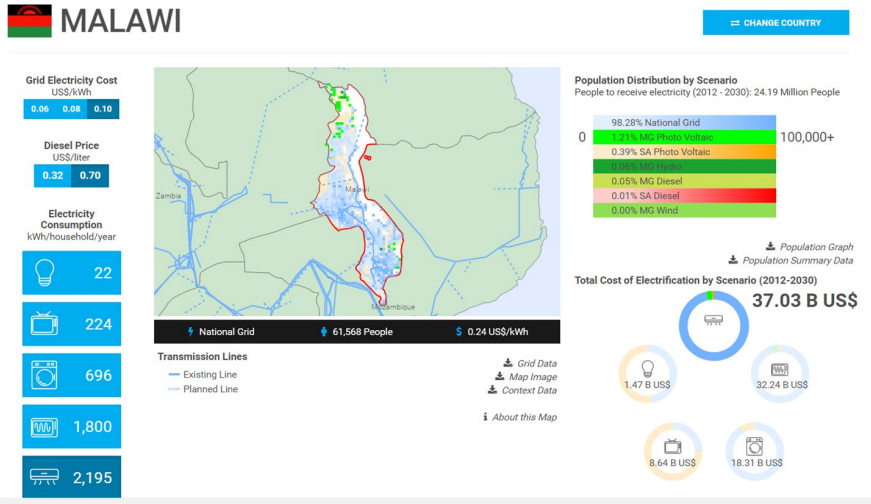




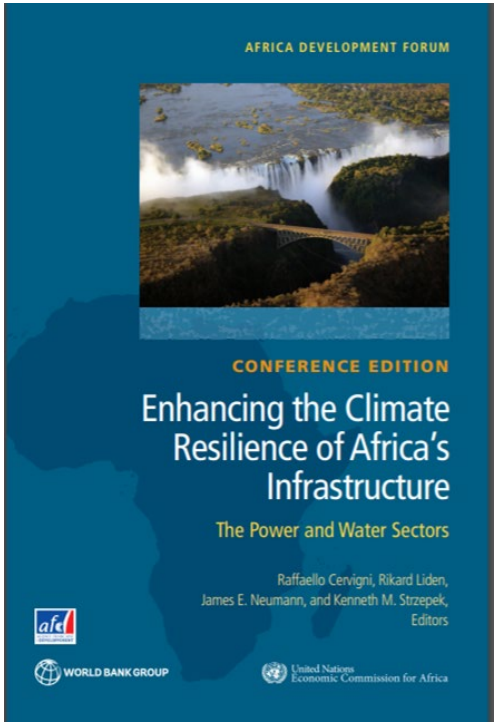


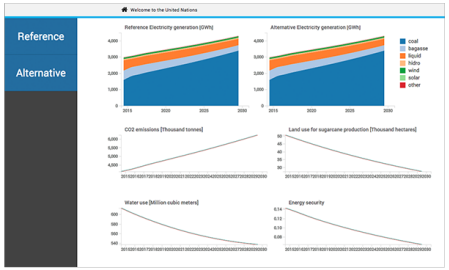
Climate compatible Energy Strategies

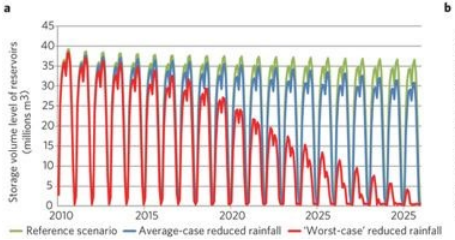
INTENDED NATIONALLY DETERMINED CONTRIBUTION FROM THE PLURINATIONAL STATE OF BOLIVIA

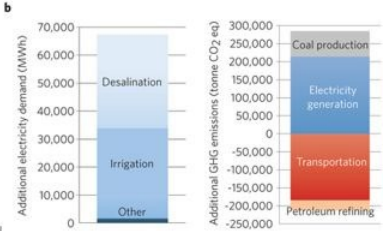
Energy

For the modelling of the scenarios in the electricity sector, as well as the calculation of carbon equivalent emissions (CO2e) and the optimization for each stage of electricity generation, the OSeMOSYS program (Open-Source Energy Modelling System), developed by the Royal Institute of Technology in Sweden (KTH)[1]. This program is an open source software that allows modelling and optimization the planning of medium and long-term energy systems.

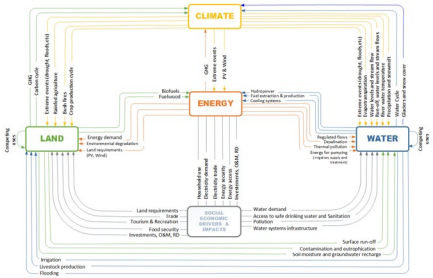


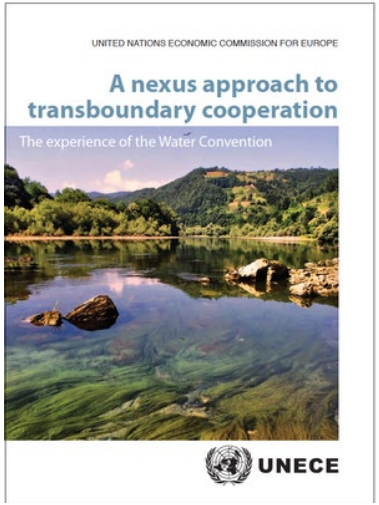






Climate compatible Development





Welcome to the United Nations

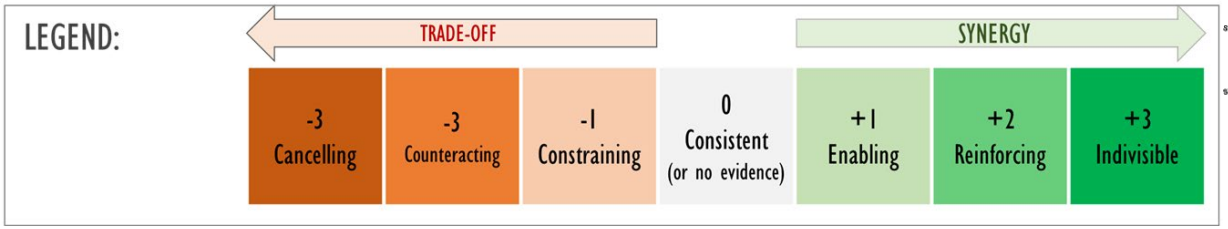
COMPARE CLIMATE SCENARIOS

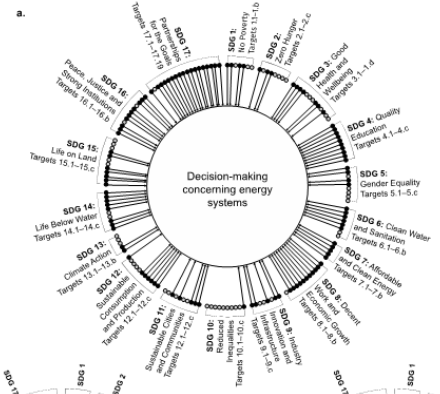
Use the dropdown menus to compare the emissions and energy produced by various industries under different scenarios from 2010 to 2050. All scenarios follow current assumptions for energy supply and renewable energy generation potentials.

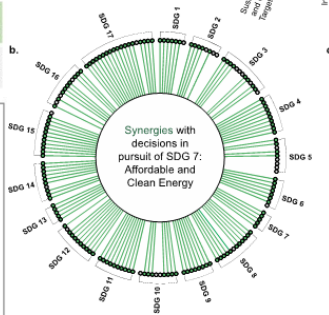
guide
trade-offs
emissions & use
energy supply

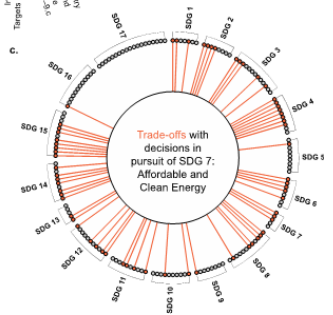
CHOOSE SCENARIO: Baseline Scenario	CHOOSE SCENARIO: 2 degrees Scenario
This is the **business-as-usual** scenario. Greenhouse gas emissions are expected to **increase average temperature to between 4°C and 6°C**. Consumption and production grow according to trend and no new environmental regulations are considered.	This scenario poses a limit on use of fossil fuels such that **average global temperature does not increase above 2°C**.
CUMULATIVE AMOUNTS, 2010 TO 2050	CUMULATIVE AMOUNTS, 2010 TO 2050
How much water is consumed?	*How much water is consumed?*
1,850 km³ baseline value	2,454 km³
Annual average is 142% of 2010 values	Annual average is 189% of 2010 values
How much CO_2 is produced?	*How much CO_2 is produced?*
1,552 CO_2 eq	1,052 CO_2 eq
Annual average is 123% of 2010 values	Annual average is 83% of 2010 values
What is the total investment in energy and material production?	*What is the total investment in energy and material production?*
$228,071 billion 2010 USD	$256,257 billion 2010 USD
Annual average is 8.1% of global GDP	Annual average is 9.2% of global GDP

Climate compatible Development













¨It always seems impossible, until it's done...¨

-Nelson Mandela

Thank you for your attention