

UN sustainable energy initiative could put world on a path to climate targets

February 24 2013

The new study in *Nature Climate Change* shows that reaching the 3 energy-related objectives proposed by the United Nations in their Sustainable Energy for All (SE4All) initiative, launched in 2011, would reduce emissions of greenhouse gases that contribute to climate change and, in combination with other measures, could help keep global temperature rise from exceeding the internationally agreed target level of 2°C.

"Achievement of the 3 objectives would provide an important entry point into stringent [climate](#) protection," says Joeri Rogelj, ETH Zurich researcher and IIASA-affiliated scientist, who led the study. The study found that the short-term objectives, which aim for 2030, would help achieve long-term climate targets. However, to ensure achievement of stringent climate objectives, SE4ALL would need to be complemented by other measures, the researchers say. The SE4All objectives include providing universal access to modern [energy](#), doubling the share of renewable energy globally, and doubling the rate of improvement in energy efficiency—all by 2030. While the SE4All objectives do not explicitly address climate change, it is clear that sustainable energy is a prerequisite for reducing greenhouse gas emissions: 80% of human [carbon dioxide emissions](#) come from the global energy system, including transportation, buildings, industry, and electricity, heat, and fuel production.

"Doing energy right will promote the [Millennium Development Goals](#), such as poverty eradication and social empowerment, and at the same

time kick-start the transition to a lower-carbon economy," says IIASA researcher David McCollum, who also worked on the study. "But the UN's objectives must be complemented by a [global agreement](#) on controlling [greenhouse gas emissions](#)."

While the UN energy objectives are formulated as global goals, the researchers also note that regional and national actions will be vital to achieving them. IIASA Energy program leader Keywan Riahi and study co-author says, "The next step for this initiative is already underway, with a large number of national plans that underpin the global objectives."

The researchers carried out an analysis to determine how likely we would be to limit climate warming to target levels if each or all of the SE4All objectives were achieved. Using a broad range of scenarios, the researchers found that if all the objectives were met, the likelihood of keeping temperature rise below 2°C would be more than 66%. → If only the renewable energy goal is met, chances of keeping temperatures below 2°C would range from 40 to 90%, while achieving just the energy efficiency goal would improve the chances to between 60 and 90%. But the researchers warn that the latter result depends strongly on what economic growth is assumed in the future. The researchers note that the likelihood of reaching climate targets within the scenarios depended on a variety of other factors, including future energy demand growth, economic growth, and technological innovation.

The study also found that providing universal energy access by 2030 will not hinder long-term climate goals, thanks to the marked gains in energy efficiency that will result. "Sustainable development and poverty eradication can go hand in hand with mitigating climate risks," says Rogelj.

The new work also quantified the potential costs for reaching the SE4All

objectives, which would amount to increasing energy investments between 0.1 and 0.7% of global GDP. The authors' estimates account for the substantial savings in energy use and reduced fossil energy investments that would come about through the promotion of more sustainable energy technologies and lifestyles.

The study used an analysis framework called Integrated Assessment Modeling (IAM), which combines economic, geophysical, biological, social, and engineering science to systematically analyze possible future developments in the human-earth system from a broad perspective. In this study, the researchers used IIASA's energy model MESSAGE along with the probabilistic climate model MAGICC. More than 500 detailed scenarios were developed, building upon the recently released Global Energy Assessment.

More information: Rogelj, J., D.L. McCollum, and K. Riahi, 2013, "The UN's 'Sustainable Energy for All' initiative is compatible with a warming limit of 2 °C," *Nature Climate Change*, [DOI: 10.1038/NCLIMATE1806](https://doi.org/10.1038/NCLIMATE1806)

Provided by International Institute for Applied Systems Analysis

Citation: UN sustainable energy initiative could put world on a path to climate targets (2013, February 24) retrieved 26 April 2024 from <https://phys.org/news/2013-02-sustainable-energy-world-path-climate.html>

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