

## RETScreen™ International: a decision support and capacity building tool for assessing potential renewable energy projects

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Most countries have ample renewable energy resources available to them, such as sun, wind, water, biomass and/or geothermal. Renewable energy technologies (RETs) are sufficiently developed and reliable to meet an increased proportion of the world's energy needs. In fact, renewable energy projects are presently cost-effective in a number of applications.

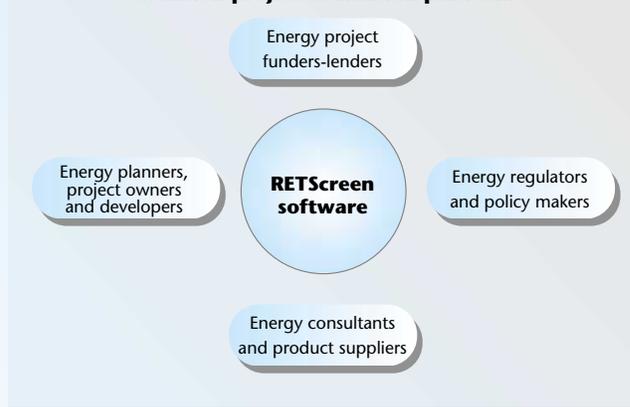
“Global climate change mitigation particularly depends on widespread use of these technologies in all countries. These technologies can also advance important national development goals, such as cleaner air, energy services for rural populations, and more efficient domestic industries. Many opportunities exist to utilize these technologies, although realization of opportunities is often constrained by many barriers.”<sup>1</sup> The barriers include “lack of information about technologies, opportunities, costs and benefits; lack of human resource and institutional capacities to evaluate, finance and conduct investment projects; high transaction costs; and other institutional constraints.”<sup>2</sup>

As a result of these barriers, RET projects are not routinely considered by utility planners, government policy-makers, bankers, engineers, architects and other decision-makers at the critically important initial planning stage, even where they have proven cost-effective and reliable in similar situations. If RET projects are not put “on the table” up front, it is usually impossible to have them considered later in the energy project or programme development process. The RETScreen Renewable Energy Project Analysis Software was developed to address this important problem.

### RETScreen International

RETScreen International is an innovative and unique renewable energy awareness, decision support and capacity building tool developed by Natural Resources Canada's CANMET Energy Diversification Research Laboratory (CEDRL) with the contribution of over 70 experts from industry, government and academia (see <http://retscreen.gc.ca>). Its core consists of a standardized and integrated renewable energy project analysis software that can be used worldwide to evaluate energy production, life cycle costs and greenhouse gas emission reductions for various types of RETs. In addition to the software, RETScreen includes: product, cost and weather databases; an online manual; a website; project case studies; and a training course.

**Figure 1**  
**Common project evaluation platform**



### The new UNEP GHG model

UNEP's Division of Technology, Industry and Economics (DTIE) and CEDRL are cooperating to increase awareness and enhance the usefulness of RETScreen. They have concluded that one way to bring about an increase in RET investments is to help project promoters and their financial backers better analyze the technical and financial viability of possible projects. As part of this collaboration, UNEP DTIE and CEDRL have developed a new greenhouse gas emissions mitigation model for RETScreen, with funding from the Global Environment Facility. The UNEP Collaborating Centre on Energy and Environment has also participated in this work. The new GHG model allows users to estimate the greenhouse gas emissions avoided, as well as the Clean Development Mechanism (CDM) and Joint Implementation (JI) financial impacts of the proposed RET project. Use of this model simplifies calculation of GHG emissions. It results in substantial cost savings for users, and increased government and industry opportunities for CDM and JI projects.

### New NASA global satellite data

There is also cooperation between the US National Aeronautics and Space Administration (NASA) and CEDRL to facilitate use of NASA's global satellite solar data with RETScreen, and to develop a new global weather database (see <http://eosweb.larc.nasa.gov/sse>) for this tool. Sponsored as part of NASA's Earth Science Enterprise Programme, the work is being carried out at the NASA Langley Research Center and at CEDRL. This collaboration makes it possible for RETScreen users to access (free of charge) satellite data such as the amount of solar energy striking the Earth's surface and global temperatures and wind speeds, simply by clicking on links in the RETScreen software or on NASA's website. These data, which were previously available only from a limited number of ground monitoring stations, are critical for assessing the amount of energy a RET project is expected to produce. Use of the data results in substantial cost savings for users and increased market opportunities for industry, while allowing governments and industry to evaluate regional renewable energy resource potential.

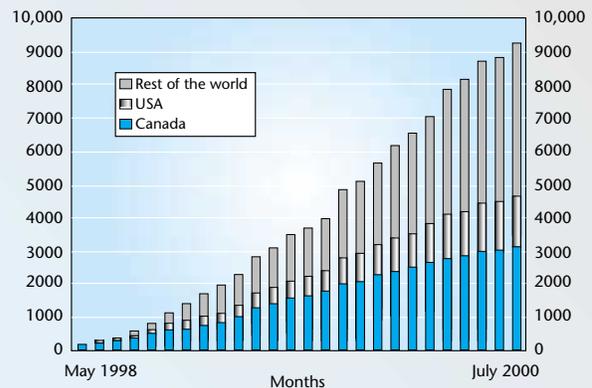
### Use of RETScreen

Numerous people worldwide have been using this tool for a variety of purposes, including: preliminary feasibility studies; project lender due diligence; market studies; policy analysis; information dissemination; training; sales of products and/or services; project development and management; and product development/R&D.

For example, RETScreen was instrumental in helping CEDRL and a team of 11 consulting firms prepare preliminary feasibility studies for 56 potential RET projects at a cost of less than \$2000 each. Similar studies would otherwise have cost in the order of five to ten times this amount! The money saved is being used to develop a number of these projects. The software also facilitates project implementation by providing a common evaluation platform for stakeholders involved in the project, as shown in Figure 2.

To illustrate how this could work, the RETScreen software files, which are in Excel format, can be shared among the various project stakeholders. A consultant may be asked to prepare a RETScreen study for the project owner, such as an independent power producer (IPP). The IPP may then want to change input values as part of a sensitivity analysis of key parameters, such as return on investment. The IPP, in turn, may be asked by the potential lender to submit the file for use in project due diligence review. In parallel, the utility regulator may want the project file to verify the GHG estimates, and so on. The time and costs required to complete this process are reduced dramatically using RETScreen.

**Figure 2**  
Growth of the RETScreen user base (as of 27 July 2000)



### Substantial international uptake

RETScreen has had a rapid uptake around the world. Since its release in May 1998, close to 10,000 users in over 170 countries have licensed a copy of the software (free of charge) from CEDRL. Expansion of the user base is shown in Figure 2. Demand is increasing at the rate of about 100 new users per week, and significant growth is now taking place outside Canada.

Rapidly increasing use of RETScreen around the world, recent development with UNEP of the GHG model, and access to global satellite data from NASA are all contributing to make RETScreen an international standard for RET project evaluations. Use of the software by planners and decision-makers increases their capacity to easily consider RET projects at the critically important initial planning stage. This will help accelerate deployment of environment-friendly RETs while saving a substantial amount of money and time.

### Notes

1. Martinot, Eric and Omar McDoom (1999) *Promoting Energy Efficiency and Renewable Energy: GEF Climate Change Projects and Impacts*, pre-publication draft, Global Environment Facility, October.
2. Ibid.