

# Clean Energy Project Analysis & RETScreen® International

[www.etscreen.net](http://www.etscreen.net)

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## Objectives of Presentation

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[www.etscreen.net](http://www.etscreen.net)



- Raise awareness of RETScreen as a free tool to help empower cleaner energy decisions

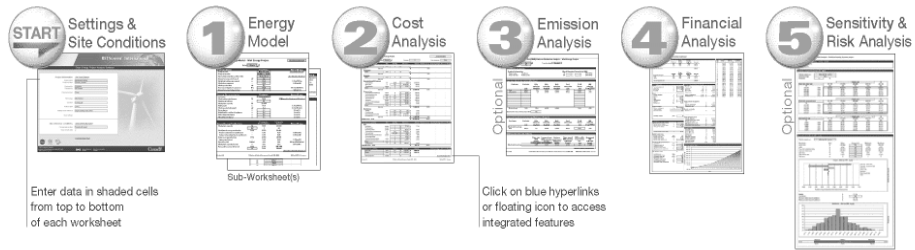


- Demonstrate how the RETScreen software works
- Show how RETScreen makes it much easier to identify & assess the viability of potential projects



- Highlight results and impacts & outline future directions for RETScreen

## Five Step Standard Analysis



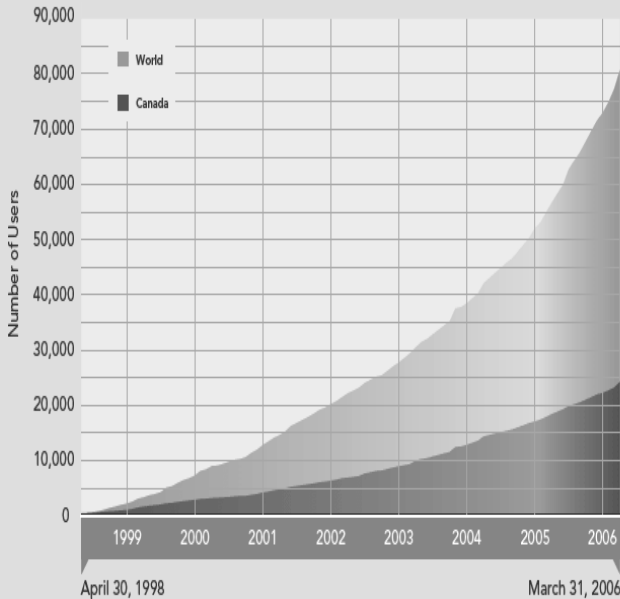
Ready to make a decision

## Integrated Features

Climate Data    Product Data    Online Manual    Tools

- Distance Learning Course
- Training Material
- Engineering Textbook
- Case Studies
- Marketplace & Maps

## RETScreen Software: Cumulative Growth of User Base



80,437 users worldwide  
from 213 countries

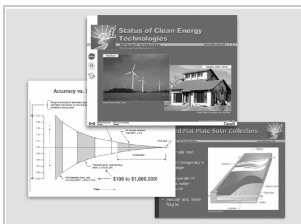
Growing at 425 users  
every week

Top Twenty Countries	
1	Canada 24,009
2	USA 10,558
3	France 8,228
4	UK 3,569
5	Spain 2,869
6	Italy 2,745
7	Australia 1,694
8	Germany 1,466
9	Belgium 1,272
10	India 1,238
11	Portugal 1,069
12	Greece 972
13	Ireland 883
14	Brazil 815
15	Mexico 673
16	Netherlands 543
17	Switzerland 508
18	Argentina 494
19	Romania 435
20	Turkey 418

# Clean Energy Project Analysis Training Material

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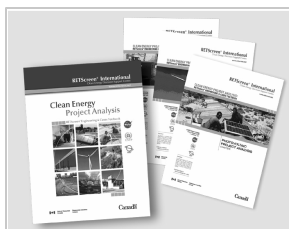


**Presentation Slides**  
(Plus instructor's voice & notes  
for distance learning)

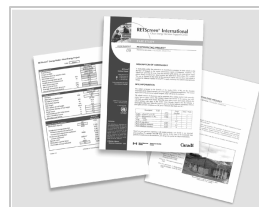
## Available free-of-charge via Website & CD-ROM

+78 Universities & Colleges use RETScreen for training

+4,000 professionals trained so far



**Engineering e-Textbook**



**Real Project Case Studies**

# Common Platform for Project Evaluation & Development

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***Raises  
awareness***

***Facilitates  
communications***

***Builds  
capacity***

***Reduces  
analysis costs  
dramatically***

***Empowers  
better decisions***



Arabic  
Bengali  
**Chinese**  
Danish  
Dutch  
**English**  
Finnish  
**French**  
**German**  
Greek  
Hindi  
Italian  
Japanese  
Korean  
Polish  
Portuguese  
Romanian  
Russian  
Spanish  
Swedish  
Telugu

## Project Viability Depends on Several Factors (Wind Energy Example)

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- **Energy resource available at project site**  
(e.g. wind speed)
- **Equipment performance**  
(e.g. wind turbine power curve)
- **Initial project costs**  
(e.g. wind turbines, towers, engineering)
- **“Base case” credits**  
(e.g. diesel generators for remote sites)
- **On-going and periodic project costs**  
(e.g. cleaning of wind turbine blades)



## Project Viability Depends on Several Factors (Wind Energy Example – cont.)

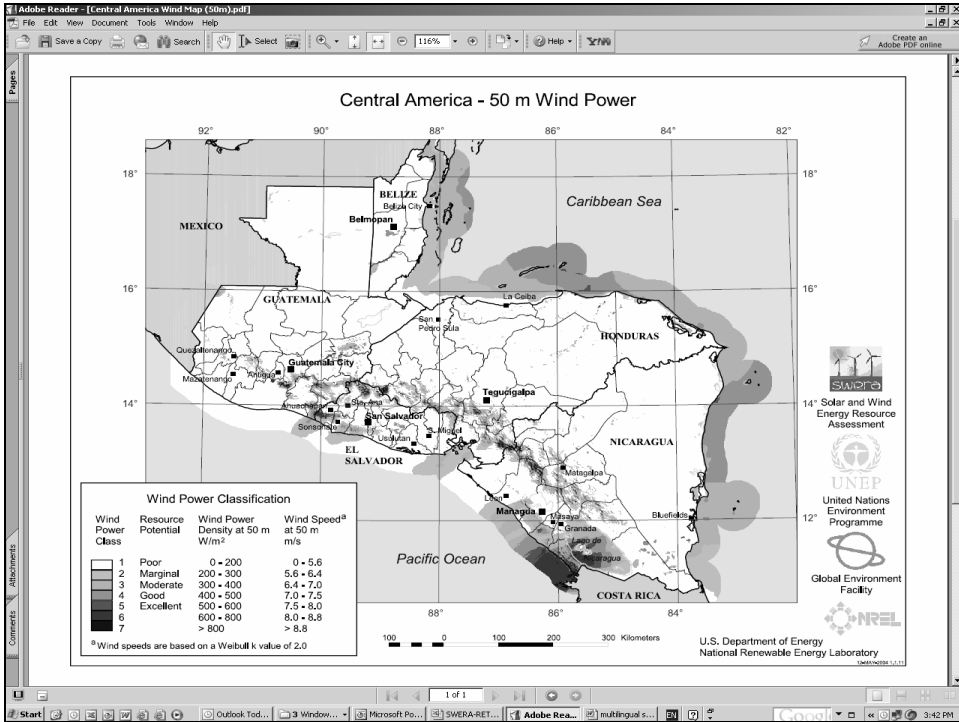
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- **Avoided cost of energy**  
(e.g. wholesale electricity price)
- **Financing**  
(e.g. debt ratio & length, interest rate)
- **Taxes on equipment & income (or savings)**
- **Environmental characteristics of energy displaced**  
(e.g. coal, natural gas, oil, large hydro, nuclear)
- **Environmental credits and/or subsidies**  
(e.g. greenpower rates, GHG credits, grants)
- **Decision-maker’s definition of cost-effective**  
(e.g. payback period, IRR, NPV, Energy production costs)



Photo Credit: Middelgrunden Wind Turbine Cooperative



## Projects Facilitated by RETScreen

**RETSCREEN® INTERNATIONAL** [www.retscreen.net](http://www.retscreen.net)

### Solarwall® on High School in Northern Canada

**Abaittuq High School**  
in Rankin Inlet

"The RETScreen software program was a key decision making tool when the Nunavut government approved the project."

Brian McCluskey  
Special Projects Officer  
Arctic Energy Alliance,  
Yellowknife, NWT, Canada

Photo credit:  
Arctic Energy Alliance

## Projects Facilitated by RETScreen

RETSCREEN® INTERNATIONAL

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### Solar Water Heating at Vancouver International Airport



100 Glazed Solar Collectors  
Near the Control Tower

"RETScreen helped  
Taylor Munro Energy  
Systems recommend  
the appropriate  
technology for a solar  
water heating system  
at Vancouver  
International Airport."

Morgan McDonald, Taylor  
Munro Energy Systems Inc.

Photo credit:  
Larry Goldstein, Vancouver  
International Airport Authority

## Projects Facilitated by RETScreen

RETSCREEN® INTERNATIONAL

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### Photovoltaic Water Pumping System in Africa



Sasso s.n.c., Italy

"We have used  
RETScreen to design  
different solar pumping  
systems installed  
in Africa."

Armando Martinez,  
Renewable Energy Consultant

Photo credit:  
Armando Martinez

## Projects Facilitated by RETScreen

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### Wind Farm in Ireland (7 Turbines x 650 kW)



Sustainable Energy Authority  
of Ireland

2003 User Survey Summary:

RETScreen Software  
used for 20 wind  
energy projects built  
or under construction,  
totalling 100 MW  
and an investment  
of \$210 million.

Paul Kellett,  
Technical Manager

Photo credit:  
Sustainable Energy Authority  
of Ireland

## RETScreen International Results and Impacts

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### *Empowering cleaner energy decisions*

Performance Indicators	Present Impact (1998 to 2004)		Future Impact (1998 to 2012)	
	Canada	World	Canada	World
User Savings	\$240 million	\$600 million	\$1.8 billion	\$7.9 billion
Installed Capacity	320 MW	1,000 MW	4.9 GW	24 GW
Installed Value	\$750 million	\$1,800 million	\$10 billion	\$41 billion
GHG Reduction	130 kT CO <sub>2</sub> /yr	630 kT CO <sub>2</sub> /yr	3.6 MT CO <sub>2</sub> /yr	20 MT CO <sub>2</sub> /yr

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## Future Directions - RETScreen Version 4

- **In partnership with NASA & REEEP, and building on previous developments with UNEP/GEF and the World Bank, NRCan is:**
  - Developing new RETScreen models to evaluate various **energy efficiency (EE) measures** (e.g. heating, cooling, ventilation and lighting) for residential, commercial & institutional buildings, and for industrial facilities & processes
  - Integrating existing RETScreen RE & cogeneration models, plus new EE models into **one software file** & adding emerging RE technologies, such as wave & ocean current power
  - Expanding the **climate database** to **4,700 ground-stations** & **integrating NASA Satellite Dataset** within the software to cover populated areas across the entire surface of planet
  - Building a new **project database** into the tool, and updating & expanding the product & cost databases
  - Translating software into **21 languages** that cover 2/3 of the world's population
  - Disseminating the software to more than **300,000 users by the end of 2012**, via the Internet & CD-ROM, plus through key stakeholders & an international network of RETScreen trainers

