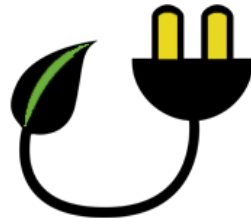


# Indicators for Renewable Energy – GEF Experience



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# Introduction to GEF



- Established in 1991, 183 member countries
- Total Funding: \$ 16 billion, \$ 93 billion co-financing
- Climate change: 1300 projects, \$ 4.7 billion
  - \$ 1.5 b, \$ 350 m for RE projects (over 50) in Americas
  - 25 RE projects completed, 18/24 rated satisfactory
  - Wind, hydropower, biomass, photovoltaic, solar-thermal, geothermal, RE represented in GEF portfolio in Latin America and Caribbean
  - Recent RE projects in the region focus more on biomass based energy



# Indicators used in GEF

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- M&E at Program level
    - Few agreed indicators for aggregation of results
    - Used by all the projects for which they are relevant
    - Adequately cover different levels of the programs causal chain
  - M&E at Project level
    - All relevant national/program level indicators used
    - Additional indicators relevant for the project specified
    - Should adequately cover different levels of the projects causal chain
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# Tracking Renewable Energy Program

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- Indicators to track
    - **Inputs:**
      - GEF funding
      - Co-financing and sources.
    - **Outputs**
      - Increase in installed capacity per technology
      - Policy, guidelines, regulations supported per sector.
    - **Outcomes and impact**
      - GHG Benefits - direct and indirect (replication)
      - Life time energy production per technology
      - Number of users per technology, etc.
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# Indicators used in GEF RE projects in Americas (1)



## **Promotion and Development of Local Solar Technologies in Chile. GEF Funding: \$2.7 m; Co-financing: \$31.8 m, IADB**

- **Objectives:**

- Promote solar technology transfer and capacity building;
- Develop projects to pilot solar technologies (Solar Water Heating, and Concentrated Solar Power)
- Support for incentives, financial mechanisms and public awareness.

- **Project Results indicators:**

- CO2 emissions avoided directly and indirectly by technology
- Solar Capacity Installed (Solar water heating, concentrated solar power)
- Electricity generated with solar technologies
- Thermal energy generated
- Number of people benefitting from installed technologies, etc.

# Indicators used in GEF RE projects in Americas (2)



## **Sustainable business models for biogas production from organic municipal solid waste in Argentina. GEF Funding: \$2.8 m, Co-financing: \$12.6 m, UNDP**

- **Objectives:**
  - To introduce biogas technologies for energy generation as part of the National Strategy for integrated municipal waste management.
- **Project Results indicators:**
  - CO2 emissions avoided directly and indirectly (through replication);
  - installed electricity generation capacity;
  - annual volume of electricity produced;
  - number of people served by the electricity produced by pilot biogas plants and replication;
  - Number of municipalities with sewage-based biogas projects;
  - number of people trained in biogas energy generation;
  - financing mobilized for investment in sewage-based biogas; etc.

# Common errors in measuring GHG relevant indicators in GEF RE projects



GHG methodology concern	Type of error
<b>Lack of consistency</b>	Inconsistent approaches used to estimate GHG benefits making comparison difficult.
<b>Installed Capacity</b>	Over or under estimation
<b>Capacity factor</b> (power that can be generated from a MW of installed capacity)	Over or under estimation: unrealistic estimate of capacity factors used.
<b>Operating hours</b>	Calculation errors
<b>System size</b>	Digits
<b>Emission factors:</b> CO <sub>2</sub> emission reduced per unit of fuel /electricity	Using marginal or Average emission factors; use of outdated emission factors
<b>Benefit period</b>	Inconsistent with methodology or comparison between technologies.

Source: *Climate Change Mitigation Impact Evaluation, GEF IEO, 2014*

# Ensuring quality of information

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- Use of prescribed standard methodologies to measure changes in indicators
  - What, why, when, who will measure
  - Budgeting M&E activities
  - Post completion arrangements for tracking changes in indicators
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# Relevance for the Parliamentarians

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- Input/output indicators – useful for oversight and supervision
    - Reporting on use of inputs, meeting milestones, outputs
    - Identifying and addressing implementation barriers
    - Is program/project being well implemented – corrective measures
  - Results Indicators – outcome of public expenditure
    - Benefits, e.g. GHG emission avoidance, energy production, installed capacity, air quality, health improvement, employment, etc.; and, unintended effects
    - Effects on vulnerable population
    - Value for money: resources used/ actual costs
    - Learning and Future direction: replicate, change, curtail, abandon?
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