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# **Overview of Renewable Energy Initiatives – CARILEC Utility Members**

OOCUR Annual Conference  
November 2006

# Brief Background on CARILEC

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## **Membership (to date):**

- Regional Association of Electric Utilities formed in 1989
- Comprised of 30 Full (Utility) Members from 28 countries in the Caribbean Region
- Also consists of 48 Associate Members (companies that provide equipment, materials and services to the utilities) and 4 Affiliate Members.

## **Main services provided:**

- Training courses, seminars, conferences
- Hurricane restoration coordination
- Benchmarking Information
- Regulatory Advisory Role
- Technical Advisory Role
- Legislative and Government Relations

# Key issues to note

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- 1) Energy mix needs to be diverse, efficient and sustainable taking least cost supply of electricity into consideration.
- 2) Satisfy customers' expectations with respect to:-
  - Reliability
  - Price
  - Quality
- 3) Renewables must be separated into two categories and incentives provided for each:-
  - Customer-based initiatives
  - Large scale utility grid-based systems
- 4) Impact of infrastructure required for use of renewables in grid-based systems and competing alternative uses for this infrastructure (e.g. land in smaller islands).
- 5) Need to carefully identify technologies that are economical and realistic for the region to implement given our size. **Note:** not because technology is feasible in larger countries means it will be feasible in the smaller ones.
- 6) Utilities do not have the resources to fund large projects involving unproven technology.
- 7) In some countries, current Regulations and/or license agreements do not cater for the utility's recovery of costs invested in renewables.

## Commercially available and emerging RE Technology

<b>Renewable Technology</b>	<b>Commercially available</b>	<b>Emerging technology</b>
<b>Wind turbines</b>	✓	
<b>Hydropower</b>	✓	
<b>Biomass</b>	✓	
<b>Geothermal</b>	✓	
<b>Photovoltaic systems</b>	✓	
<b>Fuel cells</b>	✓	✓
<b>Solar thermal</b>	✓	✓
<b>Wave energy</b>		✓
<b>Tidal energy</b>		✓

# Overview of RE Technologies – CARILEC Utilities

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## Wind Turbines:

### Existing Wind Farms:

- Jamaica and Curacao
- Wind Farms also in Guadeloupe and Martinique (not CARILEC members)

### Feasibility Studies with Wind Measurement:

- Studies and wind measurement data collection in Aruba, Barbados, Dominica, Grand Cayman, Grenada, Guyana, Nevis, Puerto Rico, St. Kitts, St. Lucia, St. Vincent
- Barbados, Guyana & Puerto Rico are at a close stage of having wind farms within the next two years

### Feasibility Studies:

- All other utilities have done some sort of feasibility study in varying detail

# Overview of RE Technologies – CARILEC Utilities

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## Wind Turbines:

### Advantages:

- Wind is free, no fuel needed
- Produces no waste greenhouse gases
- The land beneath can still be used for farming
- Maintenance requirements are minimal

### Disadvantages:

- Wind is not always predictable – some days there is no wind
- Need for back-up generation (note this must be considered in economic evaluations)
- Suitable land areas are expensive and compete with other development activities (hotels, housing)
- Hurricanes and storms vulnerability
- Corrosive environment due to salt atmosphere being on an island
- NIMBY (Not In My Back Yard) resistance from the public. (Some people feel that covering the landscape with towers can be unsightly and/or noisy)

# Overview of RE Technologies – CARILEC Utilities

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## Hydropower:

### Existing Hydro Plants:

- Dominica, Guyana, Jamaica and St. Vincent

### Advantages:

- Hydro is free, no fuel needed
- Produces no waste greenhouse gases
- Always available/predictable - No need for back-up generation

### Disadvantages:

- Of course can only be used where water is in abundance
- Potential harmful effects on eco-systems downstream of dams

# Overview of RE Technologies – CARILEC Utilities

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## Geothermal:

### Feasibility Studies:

- For obvious reasons only in volcanic islands (e.g. St. Lucia, St. Vincent & Montserrat)

### Advantages:

- Geothermal is free, no fuel needed
- Always available/predictable - No need for back-up generation
- Potential for export of electricity to neighboring islands if there is excess capacity

### Disadvantages:

- Geological risks and expensive exploratory activities
- Restrictive permitting processes to protect tourist attractions
- Very high investment costs
- Highly corrosive environment for metal components of plant



# Overview of RE Technologies – CARILEC Utilities

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## Others:

### ■ **Biofuels**

- Investigations being carried out in St. Kitts, Guyana, Puerto Rico and others.
- Being considered as replacement for sugar cane and/or banana industries in some islands

### ■ **Ocean Thermal Energy Conversion (OTEC)**

Currently being explored by Grand Cayman

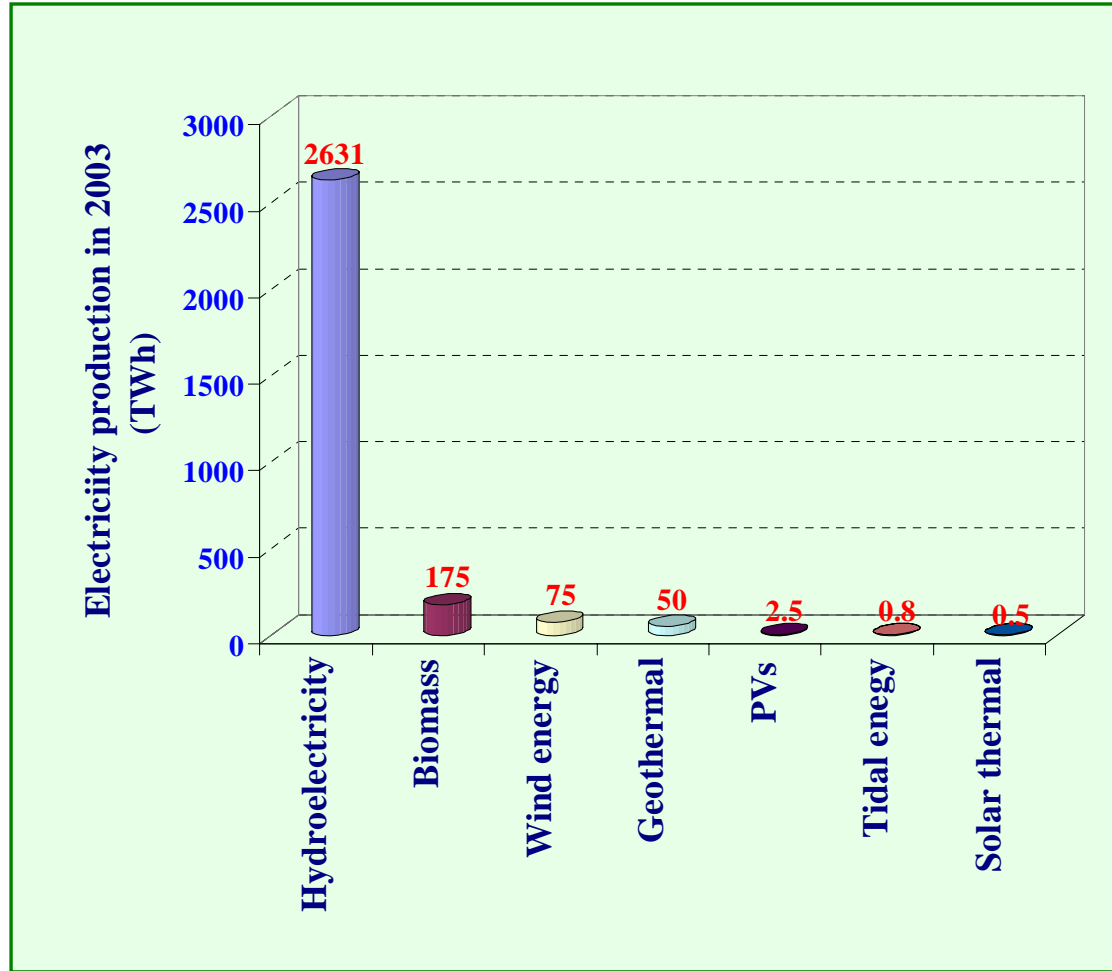
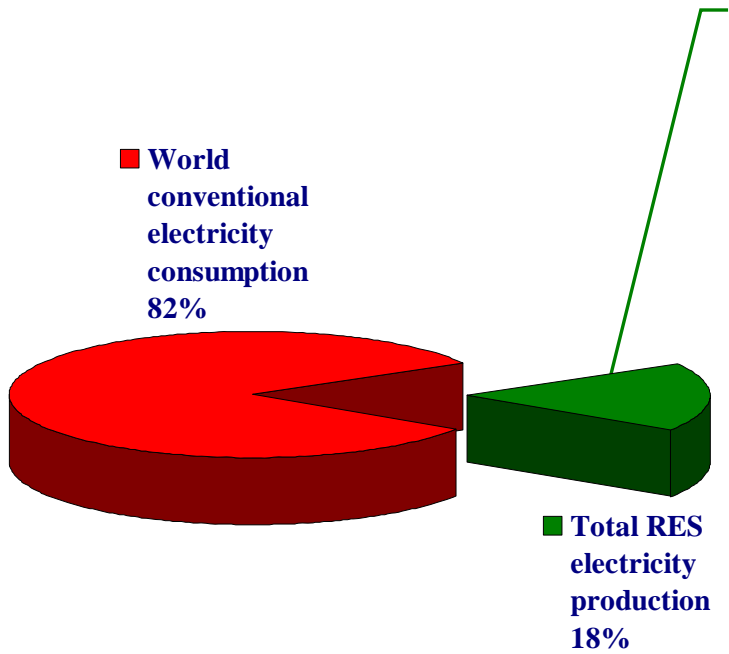
- MOU has been signed with a company promoting the technology

### ■ **Ocean Currents**

Currently being explored by Bermuda

- PPA signed with a company promoting the technology (expecting production in 2008)

# World electricity production in 2003



Source: European Commission 2005

# Current Energy Mix in European Union

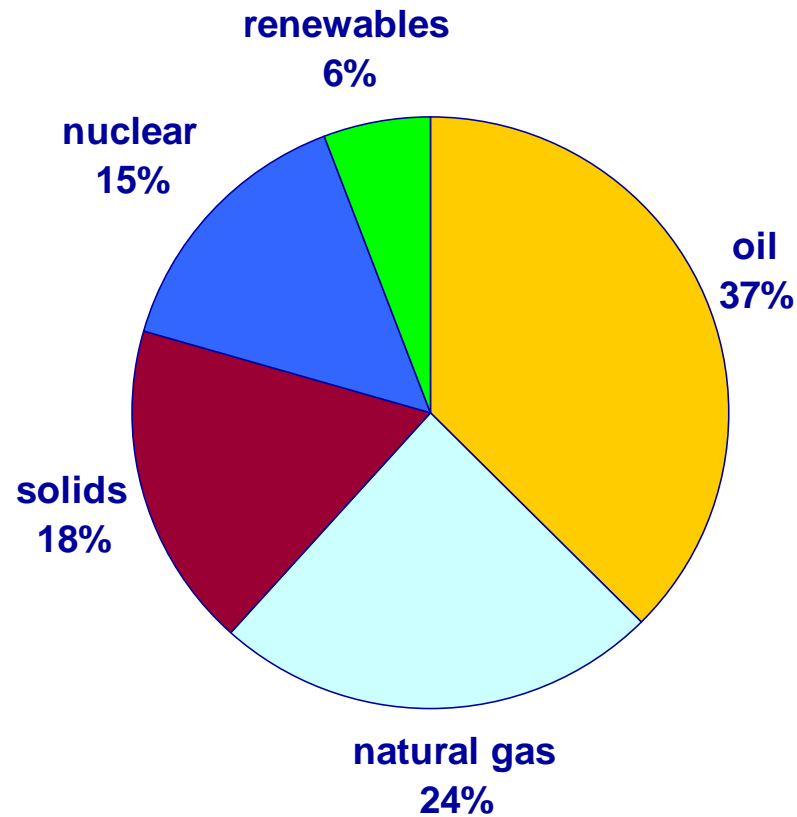


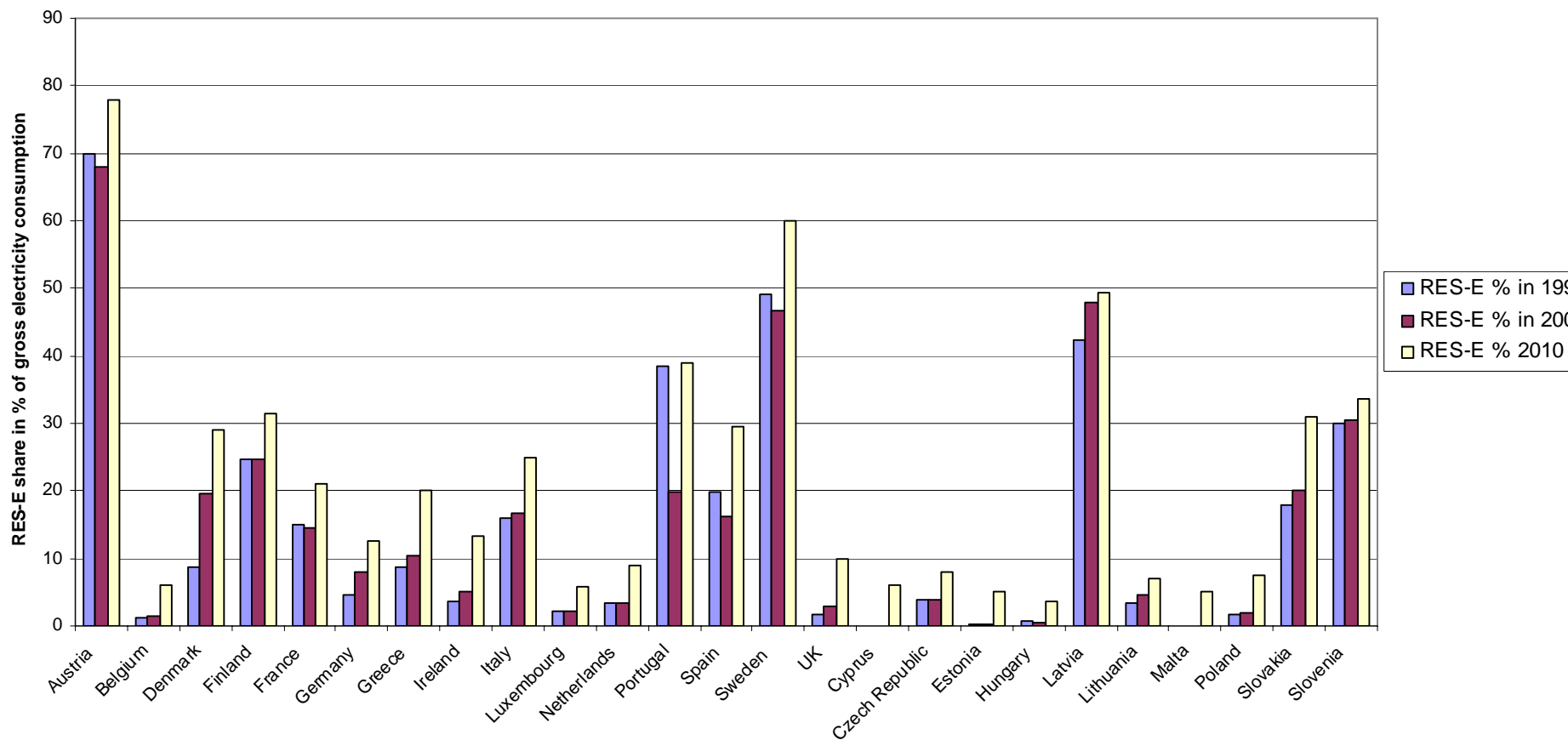
Chart from: EURELECTRIC – NESIS Seminar 2006  
Source Data from: European Commission Directorate-  
General for Energy and Transport

## Will EU-25 achieve its targets in 2010?

	<b>Target 2010</b>	Likely achievement without additional policies	<b>With additional <u>existing</u> policies</b>
<b>RES-Electricity</b>	21%	18-19%	22-24%
<b>RES-Heating</b>	No % target Currently at 11%	12%	15%
<b>Biofuels</b>	5.75%	~2-3%	~5%
<b>RES total</b>	12%	8-9%	11-12%

# EU25 Differences in the progress achieving the RES-E target

## RES-E share in EU25 – current situation



# Suggested way forward

## A few items to be considered:

- Assistance required in attracting funding for capital investment in RE systems
- Use of proven/economical technology should only be considered unless someone with “deep pockets” is willing to take the risks
- Regulatory reform required (currently ongoing in most islands)
  - Collaboration between utilities and regulators to achieve a win-win situation for all stakeholders.
  - There is no “one-size-fits-all” solution (different ownership structures among the utilities, etc.)
  - There should be sharing of efficiency gains between utility and customers
  - PPAs must clearly define reliability responsibility issues
- 4. Incentives required by governments to promote use of RE technology in both consumer-based and large scale utility grid-based systems
- 5. “Pooling” of resources to share the risks and experiences in some of the “emerging” RE technologies
- 6. “Pooling” of projects to present a bigger market for manufacturers
  - major (wind turbine) manufacturers are fully booked with orders for the next 2-3 years
  - prices are at a premium for small orders because of current demand
  - modifications to suit Caribbean conditions (storms & corrosion) at a significant premium

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**THANK YOU**

**Questions / Discussion**