



Ministerio de Electricidad
y Energía Renovable



Galápagos Islands Zero Fossil Fuels Initiative



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<http://meer.gob.ec>



Ecuador and The Galapagos Islands

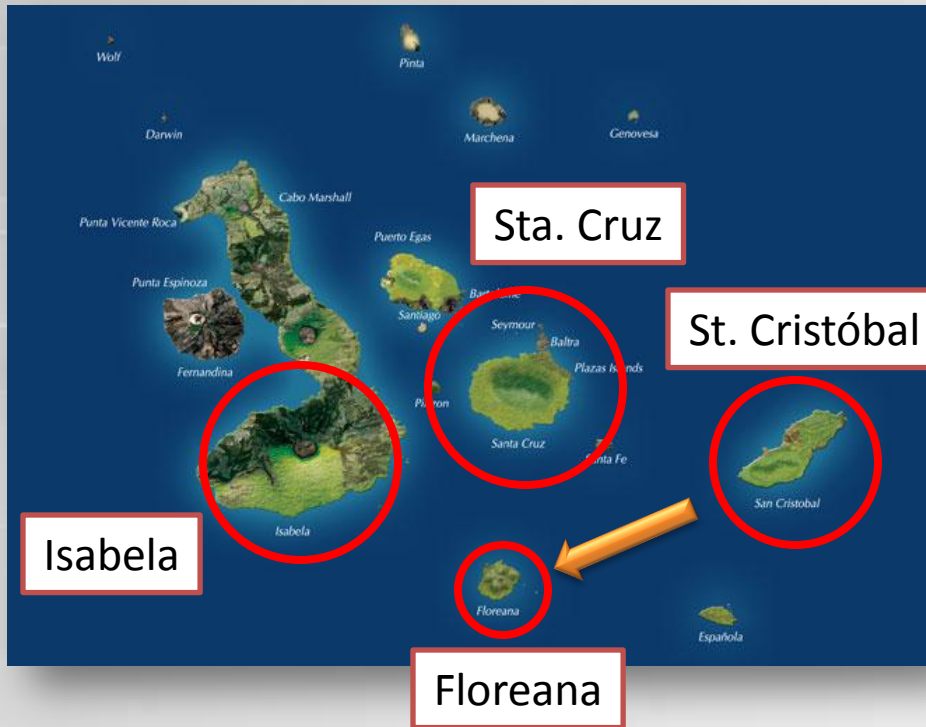




The Galapagos Islands

FACTS

- UNESCO WORLD HERITAGE SITE (1978)
- Population: 25,000 (2011)
- Area: 7,880 km² (3,040 sq mi)
- 15 main islands, 3 smaller islands, and 107 rocks and islets.
- >90% of the area is National Park





Environmental risk

Oil tanker “Jessica” in 2001 spilled:
70 000 gal diesel and 75 000 gal fuel oil.
Causing the death of 10 000 marine iguanas and other species.



2 400 000 gallons of Diesel / annum for electricity generation



Galapagos *Zero fossil fuel* Initiative

Since 2007

3 Pillars

1. Eliminate Diesel for electricity generation, replace with solar energy, wind energy and biofuels



2. Gradual conversion of diesel engines to biofuel engines and creation of standards to introduce only EV / Hybrid vehicles.



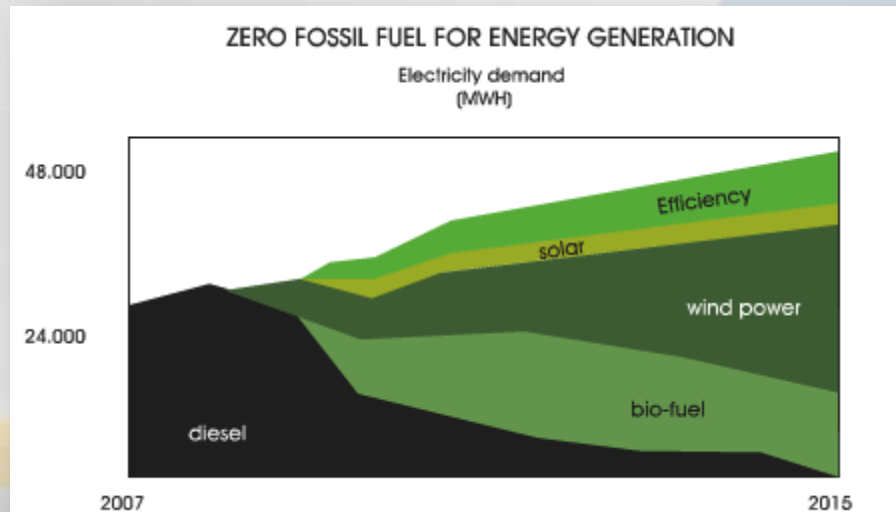
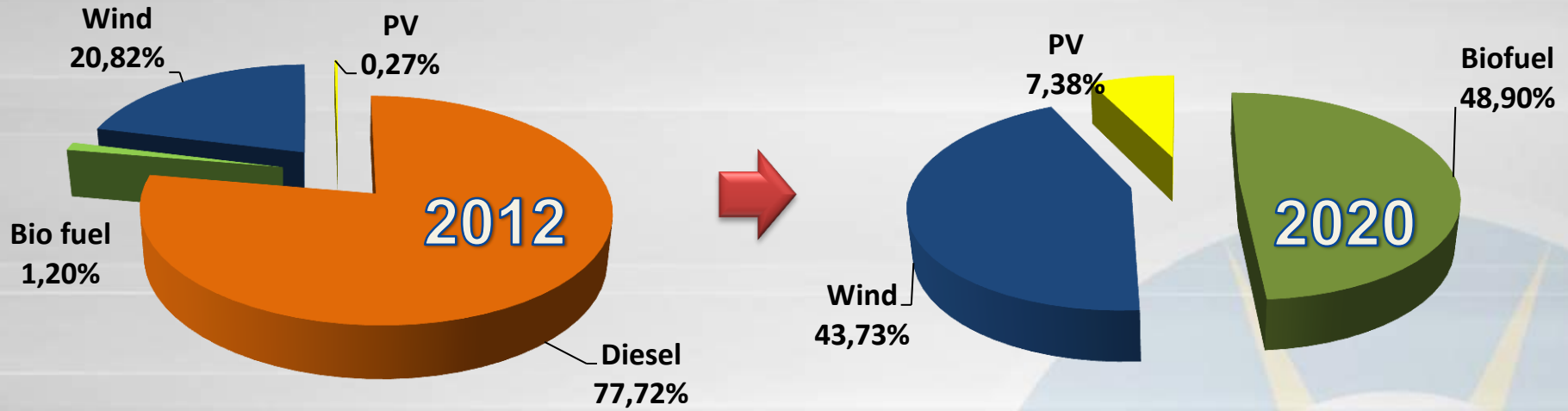
3. Gradual conversion of fishing and tourist boat engines to use biofuels.

Reduce GHG emissions
Reduce environmental risk of fuel transportation





Galapagos Zero fossil fuel Initiative





International Cooperation



Wind



Thermoelectric



Thermoelectric
with jatropha oil



Centralized PV



Power generation with Jatropha oil – A successful project



Bundesministerium
für Umwelt, Naturschutz
und Reaktorsicherheit

giz



Cooperation between MEER & GIZ - 2008

Jatropha curca

- Native crop from the continent.
- Frequently planted as living fence.
- It is not economically used.
- Protects soil from erosion
- Increases fertility
- Does not affect food security.
- Local experience



2 component project

Energy

Agriculture



Isabela

Floreana

Isla Floreana

40 families
140 inhabitants
Energy demand: 83000 kWh/y
Diesel: 56500 kWh/y
PV: 26500 kWh/y



Manabí

Manabí

40 communities
52 Community gathering points
240 direct families
2 000 indirect persons



From Jatropha to Energy



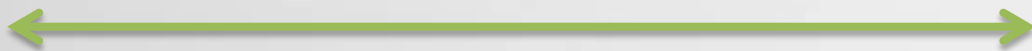
Harvest

Communitary
Gathering
Center

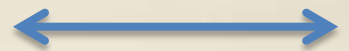
Processing

Transport

Power
generation



Continent

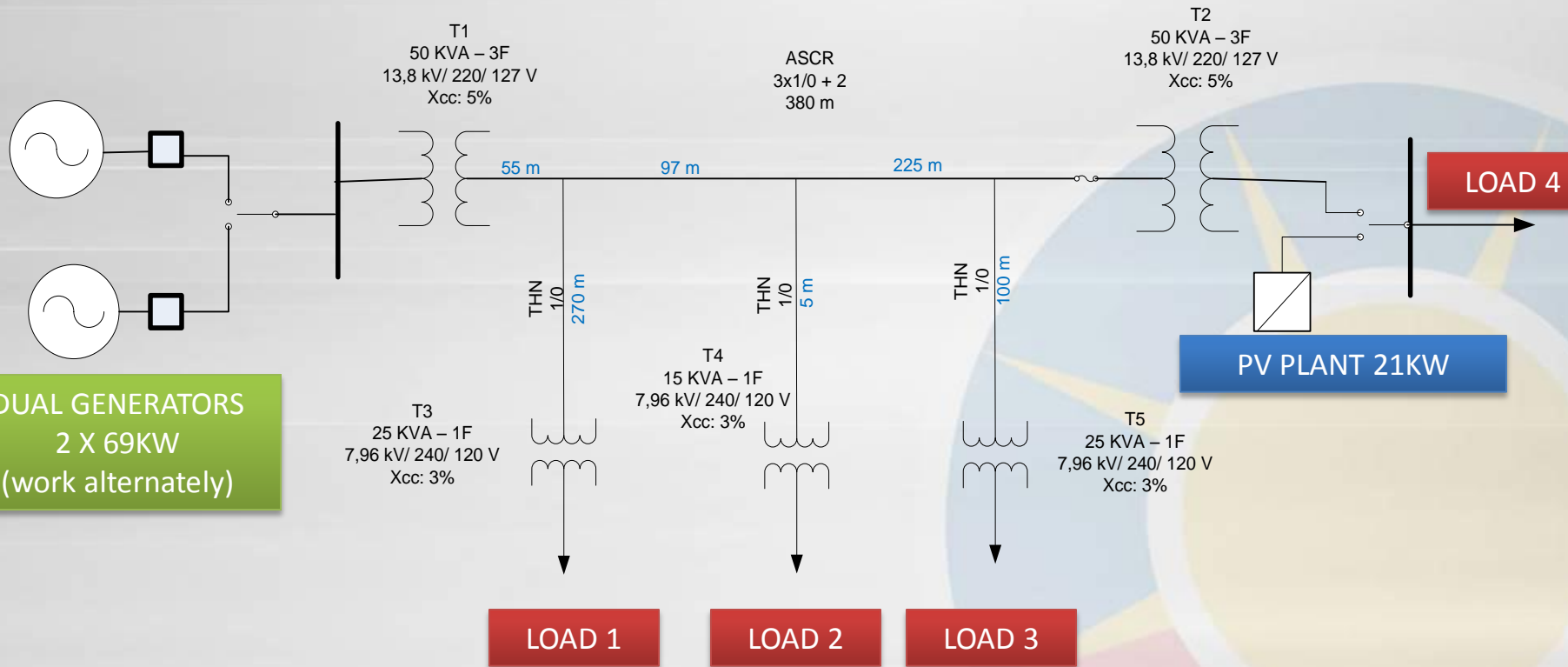


Galapagos



Isla Floreana 100% Renewable Energy Hybrid System

Isla Floreana – One Line Diagram





Challenges, approaches and technical solutions

Challenges

- Technology and knowledge transfer
- Usable land area
- Storage technologies
- Funding
- Growing population and tourism industry.

Approaches

- Energy policy
- Biofuels policy
- Energy efficiency: AC, Refrigerators & Public Lighting
- Galapagos “showroom”

Technical solutions

- 100% RE Hybrid
- PV+Wind+Biofuel
- NaS Storage
- Adapting diesel engines to work with 100% vegetable oil.
- Smart grid
- Efficient grid manager technology/inverter



Lessons learned

1. The eradication of fossil fuels on the islands is a technological, economical and environmentally feasible policy. But above all it is our responsibility.
2. Appropriate Energy Policy makes the difference.
3. The success of power generation with Jatropha oil relies on the involvement of the communities, fair prices and no attempt against land nor traditions.
4. Sustainable bio-fuels is the best way to achieve 100% RE Hybrid Systems in the Galapagos.
5. International cooperation is a proper partner for developing RE projects and supporting technical, environmental and social capacity building.



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***Thank you for your attention.
Gracias por su atención.***



Galapagos giant tortoise

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