



PROJECT

TITLE:

Wind Desalination and Hydrogen Power for Cape Verde

ACRONYM:

WDH2 Power – Cape Verde

ELECTRA, SARL

Ruy Spencer Lopes dos Santos (Exec. Admin.)

**UNIVERSIDADE DE
CABO VERDE**

António Correia e Silva (Reitor UNICV)

CENTRO DE ENERGIA E AMBIENTE

Manuel Silva – António Barbosa



UNIDO-ICHET



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
INTERNATIONAL CENTRE FOR HYDROGEN ENERGY TECHNOLOGIES

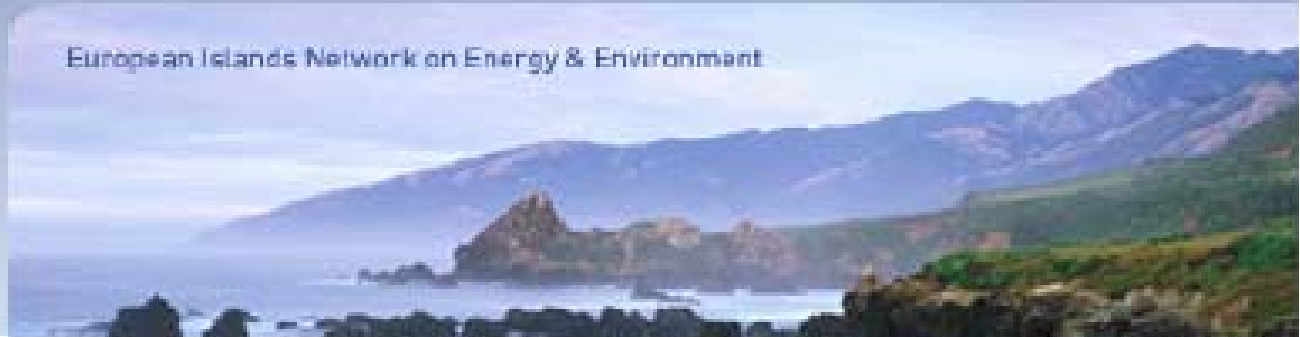
FINANCIADOR

**ORGANIZAÇÃO DAS NAÇÕES UNIDAS PARA O DESENVOLVIMENTO INDUSTRIAL
CENTRO INTERNACIONAL PARA AS TECNOLOGIAS ENERGÉTICAS DO HIDROGÉNIO**



ISLENET

European Islands Network on Energy & Environment



NEWSLETTER

September 2007

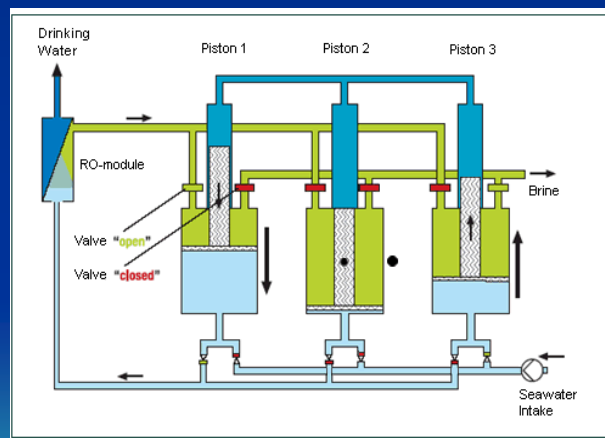
Bruxelas – Out. 2007

Dr. Nicolas Lymberopoulos
Director, Projects and Programmes
UNIDO - ICHET

ENERCON

Visita a ELECTRA em Abril 2007

DESSALINIZAÇÃO DA ÁGUA DO MAR
ALIMENTADA EM ELECTRICIDADE A PARTIR DO VENTO
SISTEMA AUTÓNOMO DA ENERCON
(3,4 Milhões de Euros)



Description of project

- ELECTRA would like to implement a very important project for its water production sector, and more than that for a water programme for Cape Verde, based on renewable energy sources.
- ELECTRA would like to introduce the Hydrogen Energy for Cape Verde in cooperation with UNIDO-ICHET and the University of Cape Verde/Centro de Energia e Ambiente (CEA) for research, development and education.
- Our proposal is to produce hydrogen from pure water (by desalination of sea water) with electricity from wind generator (see the Electra project diagram).
- With UNI.CV/CEA we will promote education, research and development in cooperation with UNIDO-ICHET.
- Finally, this project will have a direct positive economic impact in the country since in the long run, it would be able to reduce its dependence on oil import, provide capacity building of Cape Verde students and researchers at all levels, and improve water and sanitation services and education services to a large number of its population, particularly those in remote areas.

Description of feasibility study activities

- Work package 1:
Collection and preparation of data leading to design of a pilot project capable of harnessing hydrogen through electrolysis of pure water by using energy from a wind source; Production of power from hydrogen as primary source to stabilize the wind power production.
Task leader: ELECTRA
- Work package 2:
Education and training, including research and development; compilation of literature related to the field of study either using electronic means or through books; awareness campaign to educate and inform the general public of the advantages in using hydrogen as a fuel to promote an economy of hydrogen.
Duration foreseen - 3 months
Task Leader: University of Cape Verde/CEA
- Work package 3:
Mounting of a small laboratory, equipped with sufficient accessories enabling the production and storage of hydrogen through electrolysis of water and its conversion into a fuel cell;
Task leader: ELECTRA and UNI.CV

Description of deliverables

- **Deliverable 1:**

Engineering report:

Identification study collection and preparation of data leading to the design of a pilot project capable of harnessing hydrogen through electrolysis of water by using energy from a wind source; Power Production from hydrogen as primary source to stabilize the wind power production.

- **Deliverable 2:**

Study proposing a hydrogen economy for Cape Verde:

Study for the introduction of hydrogen economy and information about hydrogen use in the power sector, transport sector namely for coastal fishing fleet, heavy duty road transport and production of electricity in remote areas.

Synergy with the respective national or regional policies

- The national energy policy states that Cape Verde should diversify its source of energy in order to safeguard its economic sustainability. So far, only a marginal production of wind power is harnessed and the goals set up in the policy document foresees an increase to 25%, until 2011, of total electrical energy.
- On the other hand, due to Cape Verde's economic vulnerability, in part explained from its dimensions, namely population and size, extreme dependence on imported oil, is aggravated by the insularity, therefore, any approach to mitigate these effects goes, hand in hand, with the objective of harnessing clean forms of energy production.
- Considering the UN Framework Convention on Climate Change, it's of utmost importance to show resolve in cutting or reducing the emissions of gases with greenhouse effects. In this regard, this measure, though small in nature, but important in spirit, is in tune with regional and global initiatives that are being pursued worldwide.

Prospects of the project to proceed to implementation stage after the completion of the feasibility study

- Since ELECTRA is a partner engaged in production and distribution of energy and water in Cape Verde, and considering the high cost of its main raw material, the fossil fuel, ELECTRA is most interested in the implementation of this project and additionally is part of its annual plan and some funding has been allocated for this purpose.
- The University of Cape Verde in its mission statement, the quest for research and development is the forefront of its agenda, especially when it deals with subject that affects the economic life of the country and the well-being of its population. Therefore the engagement of University of Cape Verde is full and by its own means direct resources will be made available and other commitments through partnership with other educational institute are already in place.

Role of each partner in project implementation

- In connection with that project ELECTRA would like to introduce the Hydrogen Energy for Cape Verde with cooperation with UNIDO-ICHET and University of Cape Verde/Centro de Energia e Ambiente (CEA) for research, development and education. ELECTRA will be responsible for implementing the project, by providing land, manpower, and other resources, namely tools, transportations, logistics, etc.
- The University of Cape Verde, will be responsible to provide resources in the area of Research & Development in arrangement with other partners, namely educational institutes of Portuguese speaking countries. It will also be to provide sufficient manpower to look after the project in its entire steps.

www.electra.cv

www.unicv.gov.cv

www.iseanmar.cv

Timetable for operation

Participating Groups	Coordination Seminar Organization	H2 production and storage	Environmental Education and Hydrogen Energy	Overall Process Design
ELECTRA	X	X		X
UNICV ISECMAR CEA	X		X	X

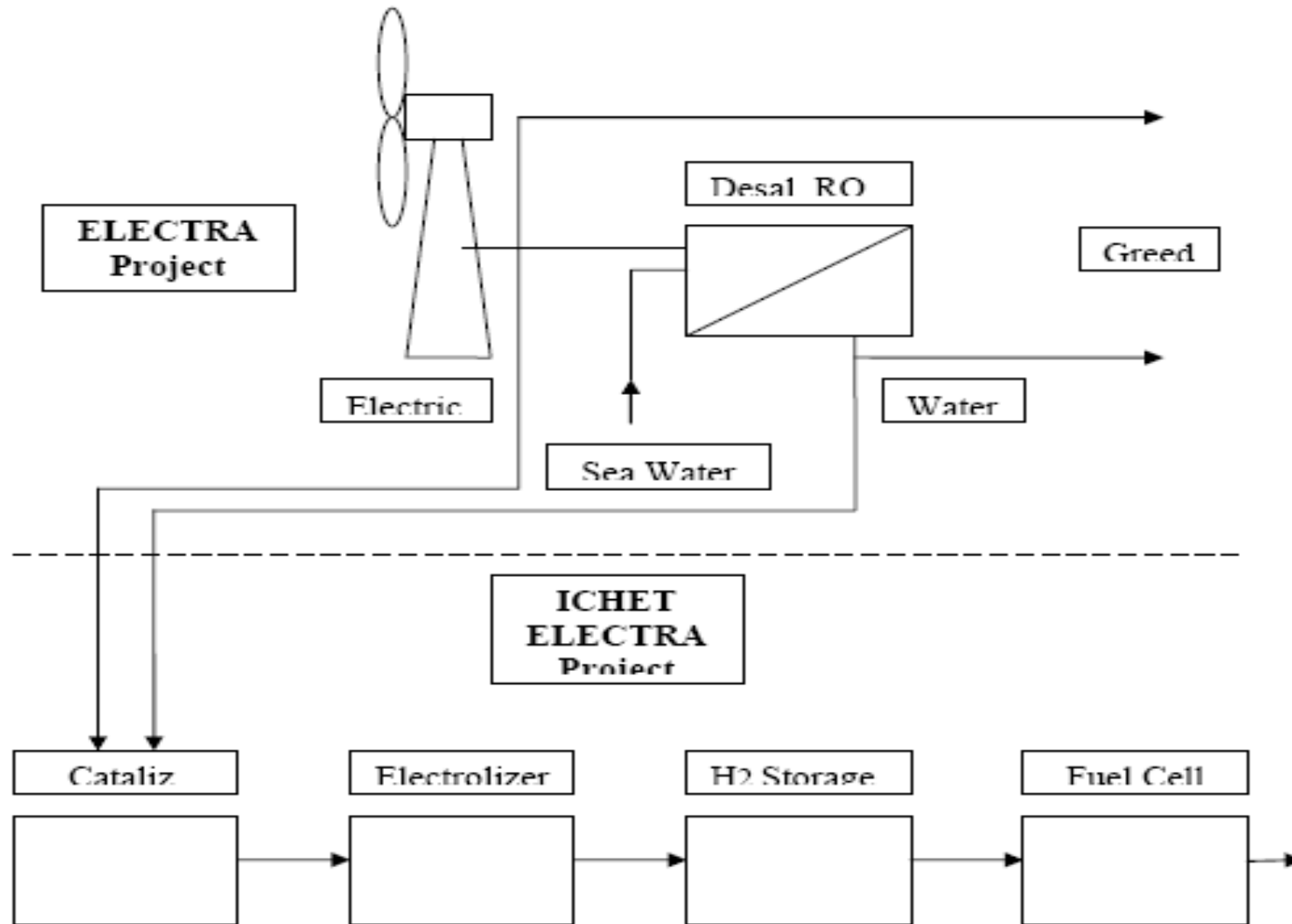
Project Activities	MARCH	APRIL	MAY	JUNE	JULY	AUGUST
Literature search Task leader: UNICV	-----	-----	-----	-----	-----	-----
Evaluation of the possible process. Task leader: ELECTRA	-----	-----	-----	-----	-----	-----
Searching for partners Task leader: ELECTRA	-----	-----	-----			
Training Courses Task leader: UNICV				-----	-----	-----
Engineering report Task leader: ELECTRA				-----	-----	-----

11. Tentative Starting and Completion Dates
1st March 2008 – 31 August 2008

PROJECT BUDGET:

	DESCRIPTION OF UNIT	Number of units	Unit Rate	Total Amount in Euros
1.	PERSONAL (EXPERT)	5 days	800 €/d	4'000 €
2.	ACCOMODATION	5 days	100 €/d	500 €
3.	TRAVEL (Europe/CV/Europe)			2'000 €
4.	PUBLICATIONS AND CONSUMABLES (SOFTWARE+HARDWARE+LAB.)			3'500 €
			Total	10'000 €

DIAGRAM:



ICELANDIC NEW ENERGY LTD.

MR. JÓN BJORN SKÚLASON
GENERAL MANAGER

Cooperação com o projecto desde
FEV. / 08

MUITO OBRIGADO !