



CIRCIE 2019

Challenges for the Islands in the era of the Circular Economy

Experience & Opportunities for the Energy/Water Plexus in Crete

Prof. Theocharis Tsoutsos

Renewable & Sustainable Energy lab

Technical University of Crete

Under the auspices of



SMile 2019

6th Sustainable Mobility & Intelligent Transport conference





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QUESTIONS:

- 1. Are policies and regulations aligned with the existing innovative industrial solutions?**
- 2. Water & energy: cost-effectiveness and availability in the islands.**
- 3. How innovation in the energy-water sectors can assist the agro-food sector and local production in the islands?**

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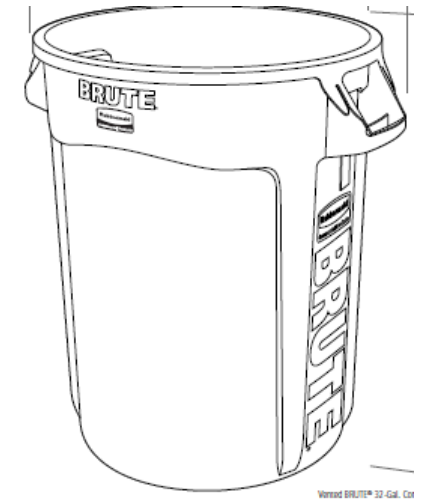
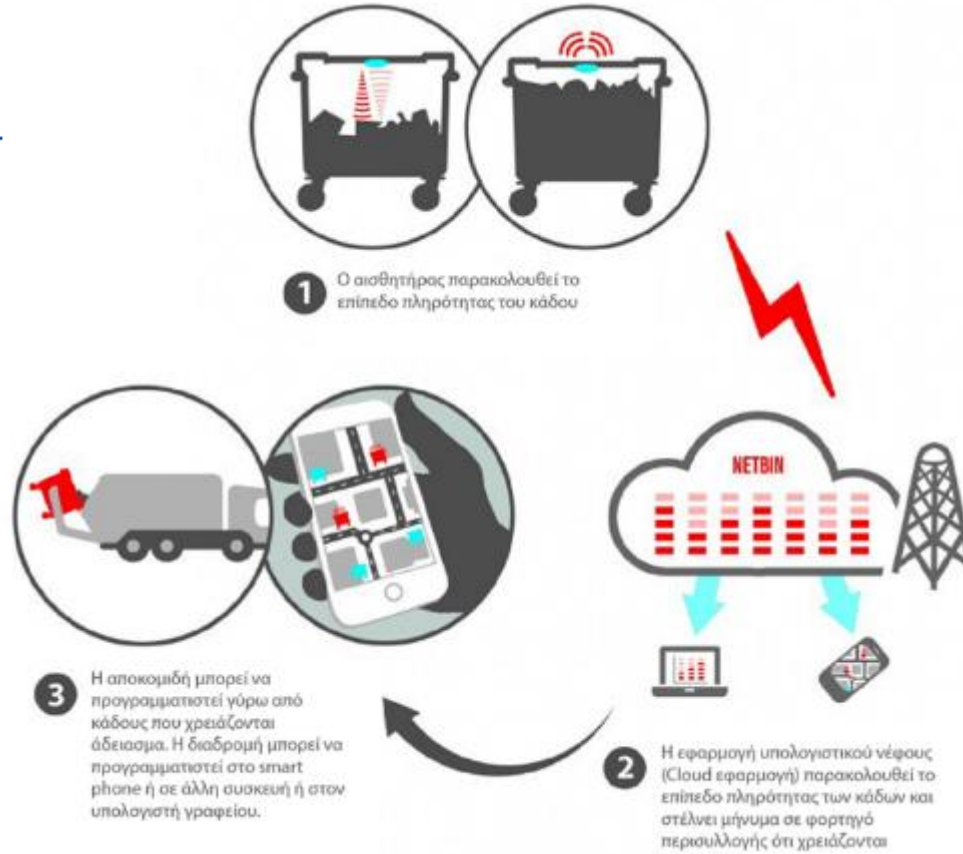
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Smart collection system - Platform

Inner and outer collection bin



Smart sensors



**UCO to biodiesel chain-
demonstration on an
urban waste collection
truck**

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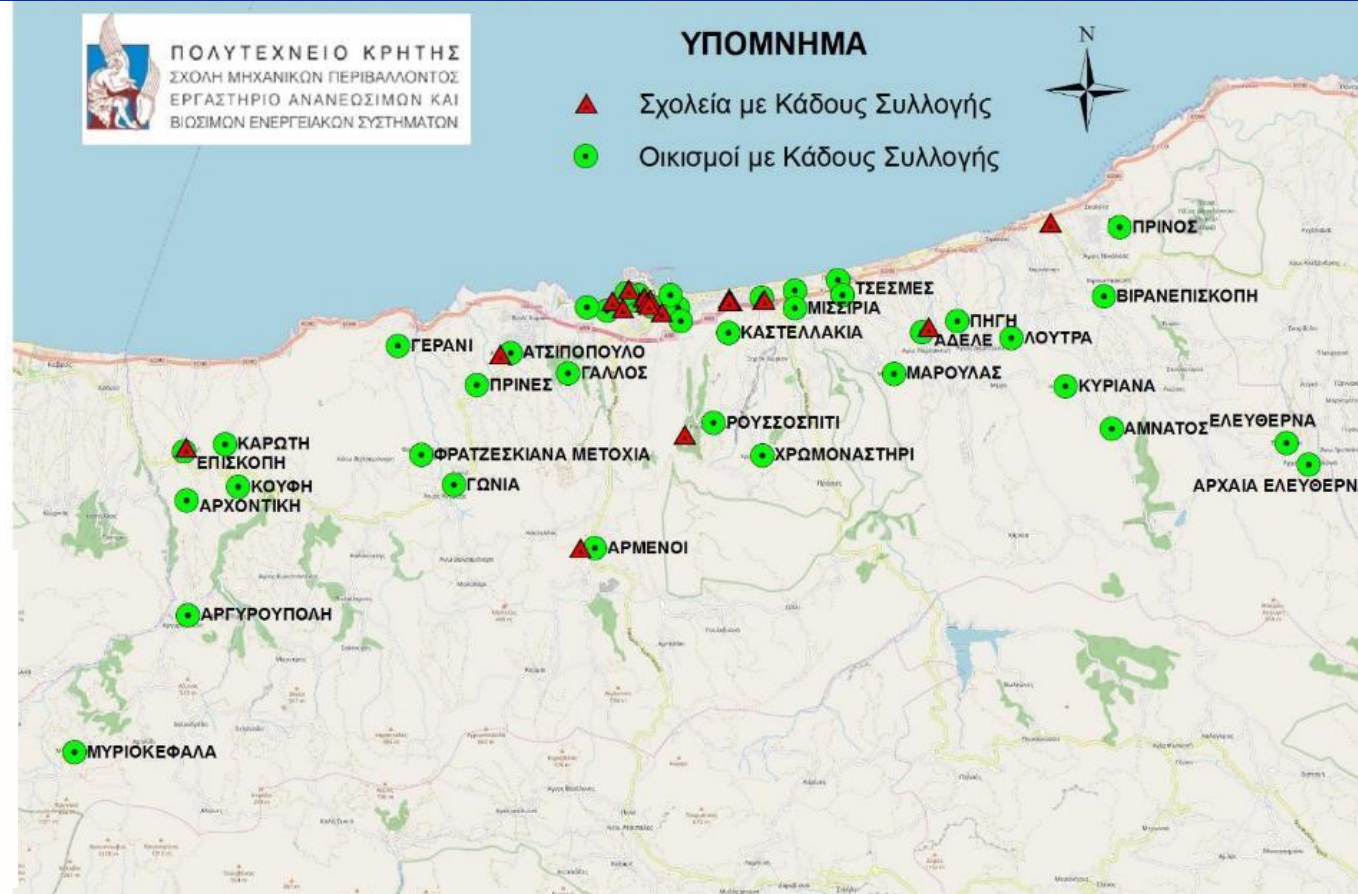
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Locations of the extended collection system – Settlements of Rethymno Municipality



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Net Metering – (Virtual) Net Metering in rural water pumping systems in Crete



- Analysis of energy demand
- Sizing and Siting of PV water pumping systems
- 20 Local Land Reclamation Organizations (TOEB)
- ~200 autopsies (done)
- By using NM can covered 8.8 MWp (49.7% of the full required)





Water Pumping Energy Efficiency Improvement in Rethymno

- *selection of the critical points in the energy consumption due to water and sewage pumping*
- *simulations*
- *design of the new energy efficient lighting- scenarios*
- *consultation with the services of the municipality, agree the proposed solution*

Proposal	Cost (€)	Energy savings (kWh/year)	Reduction of CO ₂ emissions (ton/year)	Depreciation period (years)
Replacement of two pumps	140,000	378,252	272	5.9
Replacement of Star-Triangle startup to soft start	16,000	189,126	13.2	3.4
Use of inverter	15,000	756,506	217.9	1.2
Installation of photovoltaic system with power of 20 kWp	20,000	60,000	43.2	4.2



Pumps in Agia Fotini pumping station, Rethymno





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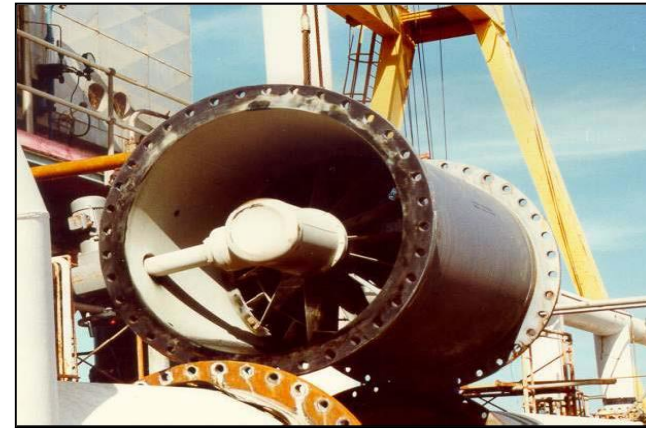


Environmental Impact Assessment Study of Thermoelectrical Power Stations (2005)

**Contracted by Associations of LAs, Prefecture
of Lasithi -Crete**



Desalination systems in Greece (2005-2007) ARCHIMEDES programme



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1. Are policies and regulations aligned with the existing innovative industrial solutions?

- Energy Cooperatives**
- RED II**
- Waste minimization policy**



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2. Water & energy: cost-effectiveness and availability in the islands.

- Water reuse**
- Exploitation of RES (PV, WE) for pumping**
- Monitor losses**





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3. How innovation in the energy-water sectors can assist the agro-food sector and local production in the islands?

- Smart Specialization (RIS3)**
- Remote control of irrigation**
- Exploitation of local renewables**
- Waste recycling (energy saving + protecting water quality)**



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HORIZONTAL NEEDS:

- Capacity building:

professional training and certification

Under- and graduate courses in Universities

Summer Schools

- Financing:

credible tools

financing mechanisms & organisations

Mainly: MORE IMPLEMENTATION & ACTIONS than PLANS & STUDIES



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Thank you for your attention



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Thursday 28 - Friday 29 March 2019, Nicosia, Cyprus

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