



**ENERGY SYSTEMS**  
Applications & Technologies

 *Green City Island*

**A Pilot Project**



## The Project

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**GREEN CITY ISLAND is a BUSINESS IMPROVEMENT proposal aimed at actualizing electricity generating Pilot Project in the country towards supporting availability of power & sustenance of Electrical Grid in Cities**

GREEN CITY ISLAND is a **modular Project**, so to allow with the necessary flexibility the build up and exercise.

It is estimated that a neighborhood of 200.000 people could be served by an **Island** composed by 3 single module.

**3 Module = 1 Island**

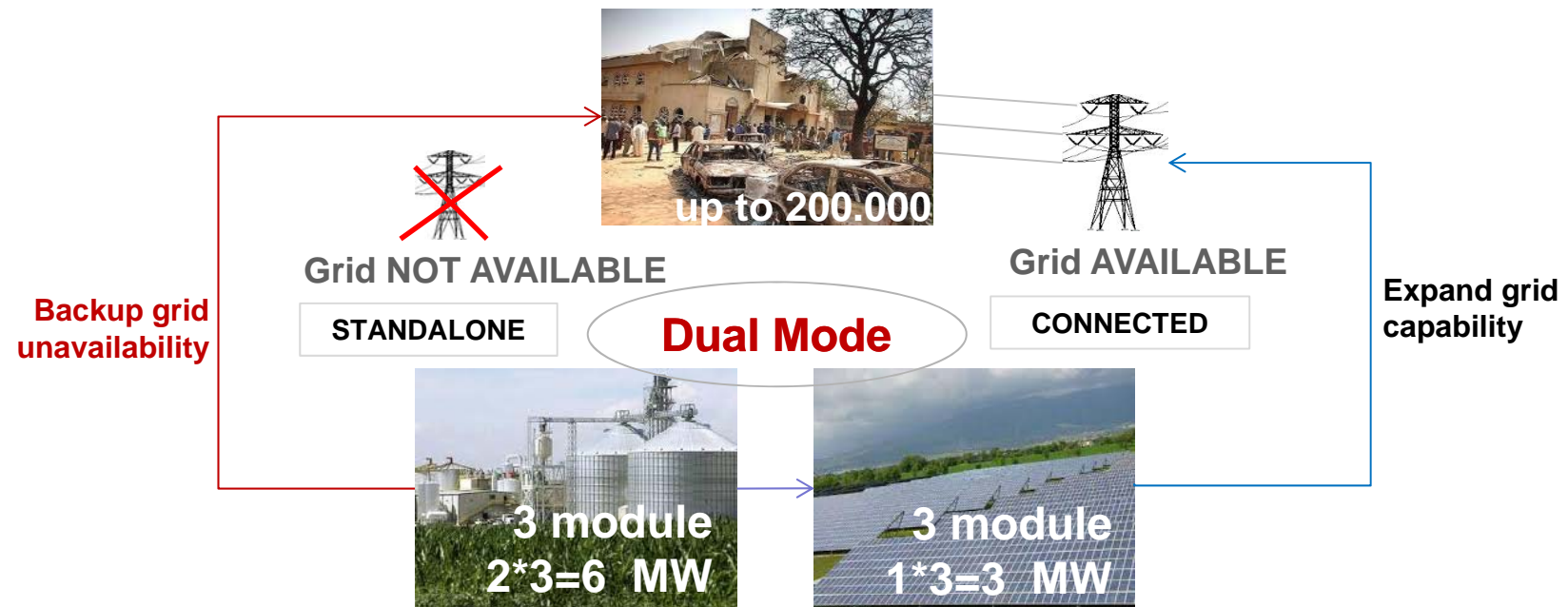
**GREEN CITY ISLAND PILOT PROJECT proposal is related to realization of the **FIRST MODULE** of an ISLAND**

# What: sizing & localization

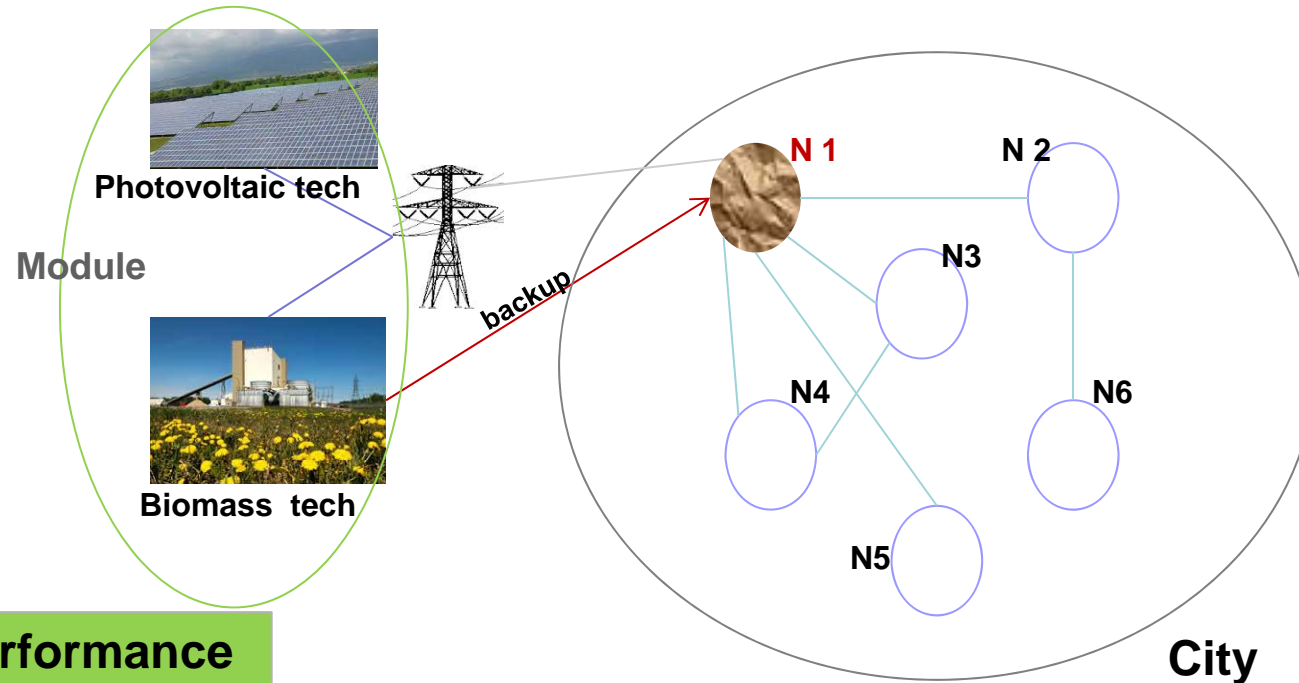
**1 Module = Power Station** based on a mix technology:

- Photovoltaic tech – 1 Module = 1 MWp – to support grid capability
- Biomass tech – 1 Module = 2 MWp in slot of 500 kWp – to support grid capability or (in case of grid unavailability) to serve as backup

**TARGET: 3 MODULE can support power & continuity of Electrical Grid for a city neighbored of 200.000 inhabitants**



# Concept schema



## Module performance

### Connected

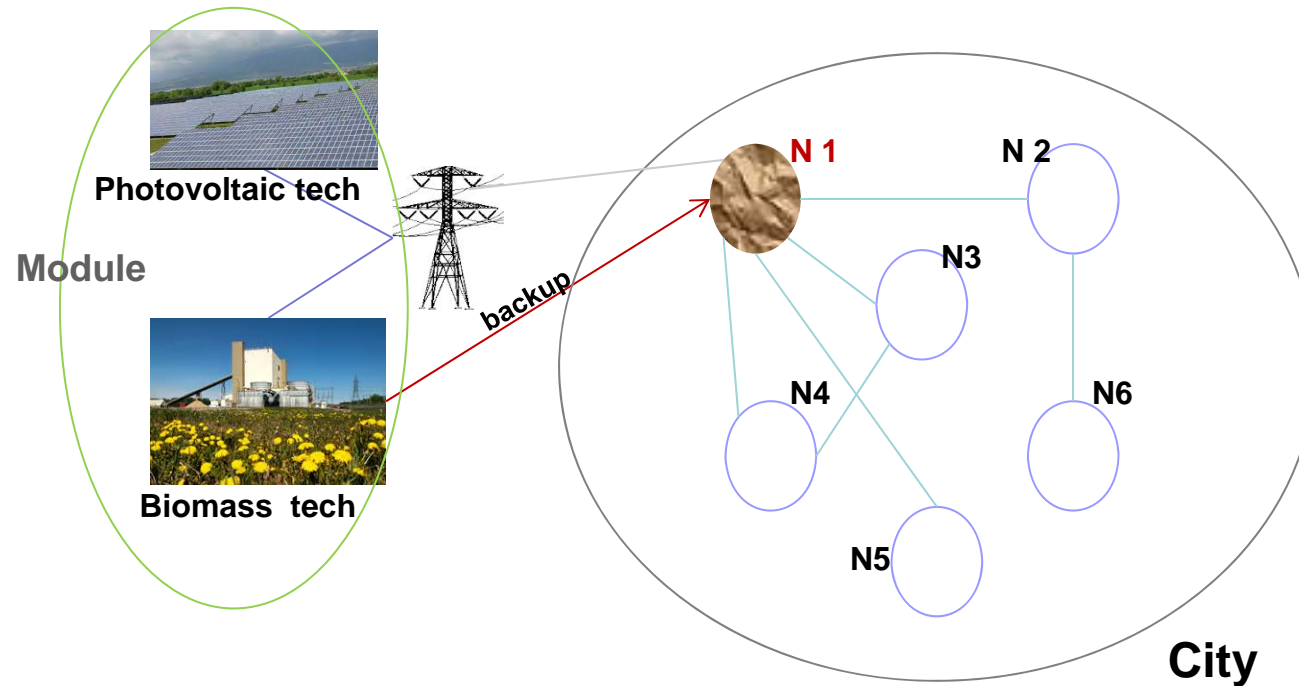
Yearly energy for the grid : +16,5 GWH  
 Extra power for the grid: +3 MW

### Standalone

In case of grid blackout (anyweather) , 1 Module could feed at least 10% of electrical users

**OPTIONAL:** to provide for each nucleus (family or office) a Storage kit (1-4 kW) to improve autonomy to 70% within 4 hours

# Module requirement



## SITE AREA

**2 hectar (215.680 ft<sup>2</sup>)** for 1 Module

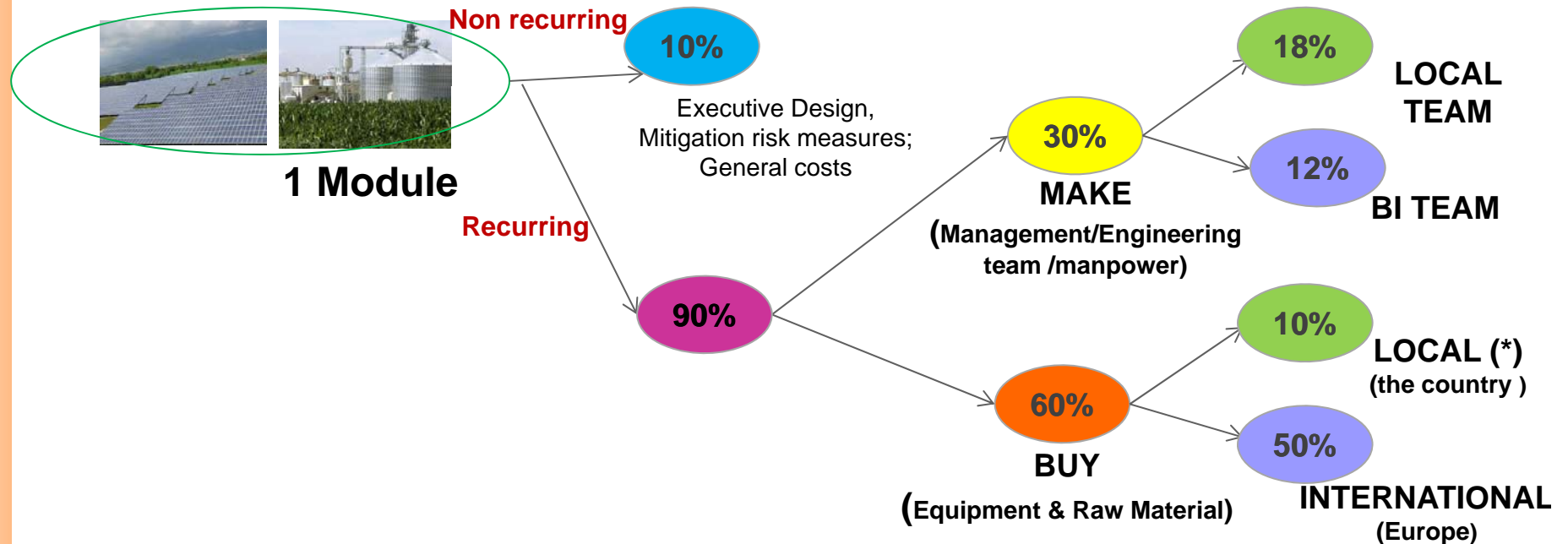
## GRID CONNECTION

Availability of a grid connection with a capability to receive a power of 3 MW

## BIOMASS FEED

It is required for year 9000 tonns/MW of wood chips (or vegetables/wood waste) and a proper road network to trasfer such wood chips feed

# Module Price

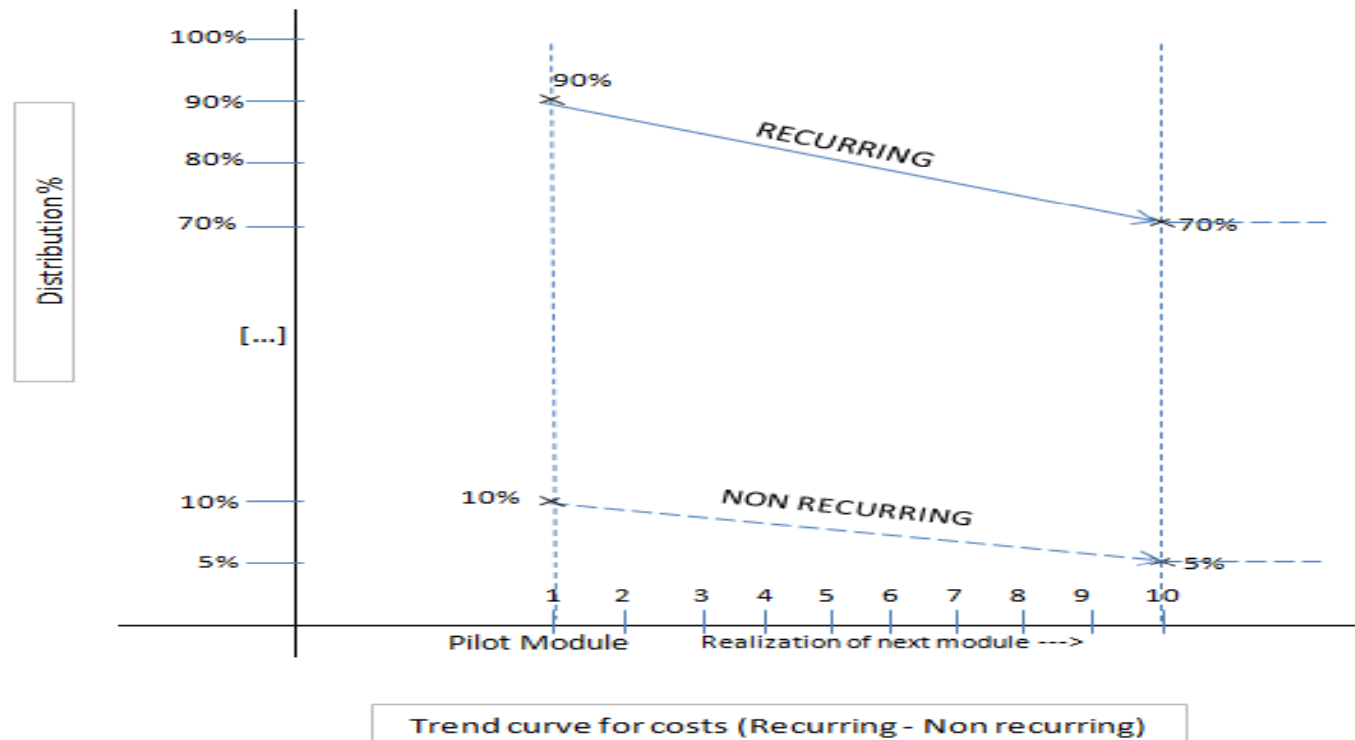


**Yearly cost for Maintenance & Feed is estimated by 8% of total cost**

- |                      |                       |                                   |
|----------------------|-----------------------|-----------------------------------|
| (*) <b>Local BUY</b> | ✓ Cables              | ✓ Thermo-hydraulic parts          |
|                      | ✓ Switchboards        | ✓ Tanks and reservoirs            |
|                      | ✓ Cabins              | ✓ Wood (chipped) for biomass feed |
|                      | ✓ Metal structures    | ✓ Small mounting parts            |
|                      | ✓ Electric components |                                   |

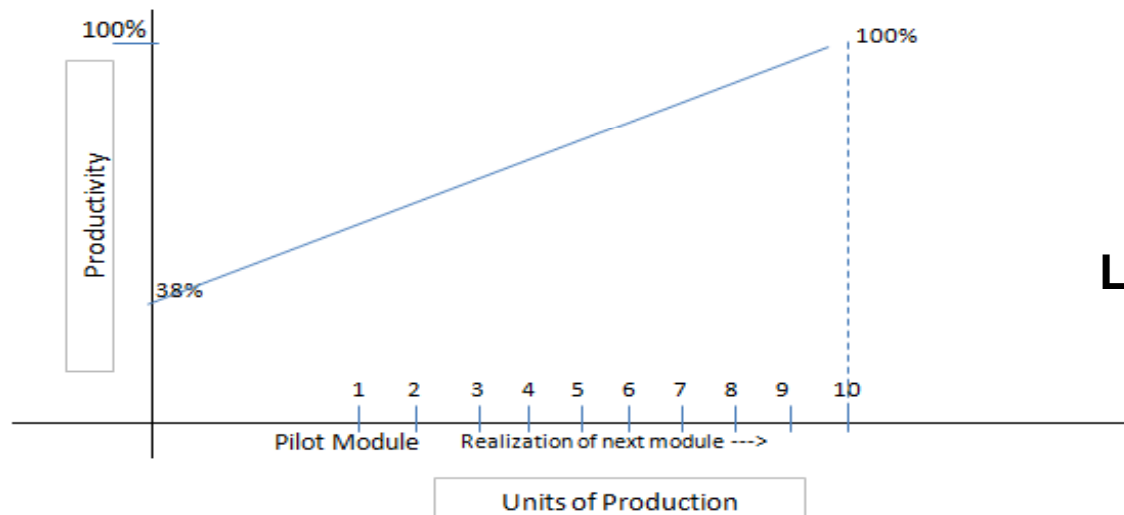
# Saving trend

GREEN CITY ISLAND is aimed to strenghten the country skills & capabilities through a technology and competence transfer from BI Team so to achieve a significant saving from the 10<sup>th</sup> module.



## Working Force: Module Project Team

The Module Project has an estimated duration covering 12 to 18 months



**Learning curve**

Local workforce will be trained by the BI team, in order to build skill capacity thereby activate a learning curve and consequently diverse distribution of activities which will dovetail into composition of formidable team



## Benefit and overall positive impact

**Green City Island is a productive investment, with many different impact on economic, social and ecological matters.**

### **DIRECT RETURN FROM**

✓ Green Energy selling

### **INCREASING OF**

✓ Grid capability & reliability

✓ Employed trained WorkForce

✓ Employment in induced sector (wood)

✓ Productivity of Companies within Green City Island (thanks to grid availability)

### **ECOLOGICAL IMPACT**

✓ Reuse of wood cheaps waste

✓ Decreasing pollution and CO2 emissions

**Payback period: 4,5 years  
Considering profit from Energy selling**

## Paulownia opportunity

The vegetable fuel for biomass plants could be generated (in the absence of proper wood industries already active) by the cultivation and processing of a crop particularly suited for such purposes: the Paulownia

The calorific value of Paulownia biomass is little over half that of coal (as is other forest biomass) but the lower content of pollutants such as sulphur (lower in Paulownia than most other biomass) and the fact that Paulownia is a readily renewable resource clearly points to its environmental benefit.



**CLIMATE RANGE:**  
from temperate to tropical

**TEMPERATURE RANGE**  
from -20 to 47°C  
Optimal around 27°C.

**ANNUAL RAINFALL**  
From 500mm to 3,000mm.  
*Optimal: 700 mm*

**BI suggest to activate Paulownia plantations in wild contexts not yet cultivated, in order to generate an additional benefit in terms of workers occupation and defense of the territory**

## STAGE I : PILOT PROJECT

## STAGE II: REALIZATION

The Pilot Project will address a **FIRST STAGE**, equivalent to 10% of the overall Module Project cost, to define **Executive Design & Realization Plan of a Module.**

Each Milestone will be submitted for approval to an **Executive Board**

### MILESTONES of STAGE I

- ✓ **Feasibility Study & Executive Design**  
After the selection of a proper Site, experts will define authorization scheme evaluating all feasibility concept thus defining design elements and constraints. The Design Team of the COMPANY will define an Executive Design for GCI Pilot Project
- ✓ **Realization Plan & Organization**  
A realization Plan will be defined, so to identify in details all necessary resources (Man & Material), economic & finance matters for realization phase. This Milestone will define also Contract Schema to be signed for next Realization Phase.

The Government will preside the **Executive Board** responsible for Milestones approval & supervision and for addressing activities towards target objectives. Executive Board composition is as follows:

- ✓ Government GCI delegate
- ✓ Local Government GCI delegate
- ✓ COMPANY delegate
- ✓ GCI Pilot Site delegate