WATER AND ENERGY FOR FAVELAS

INCUBATOR FOR YOUNG BUSINESS PEOPLE AS SOCIAL INNOVATION FOR THE
DEVELOPMENT AND IMPLEMENTATION OF WATER AND ENERGY SUPPLY MODELS
IN FAVELAS OF RIO DE JANEIRO

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Outline

- Rio favelas: key facts and figures
- Main objectives and expected outcomes of the project
- Partners involved and their roles
- Technological solutions of the project
- Social innovation of the project
- Main steps of project
Rio favelas: key facts and figures

- A favela is a Portuguese word used to define slum, an illegal settlement built on squatted lands with substandard housing, lack of infrastructure and without regularization.

- There’s usually only home made water supply and sewer system and the electric is acquired by “gato” (a ‘cat’ hook that’s thrown onto the electric supply to siphon power).

- “In the favela they don’t have to pay rent, they don’t pay electric bills or water. All they have to do is find food.” a beer vendor from a favela in Rio de Janeiro.
# Rio favelas: key facts and figures

## Information about Favelas in Brazil (Census 2010)

<table>
<thead>
<tr>
<th>Service</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Sanitation</td>
<td>67.3%</td>
</tr>
<tr>
<td>Water</td>
<td>88.3%</td>
</tr>
<tr>
<td>Electricity</td>
<td>99.7%</td>
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<tr>
<td>Garbage collection</td>
<td>95.4%</td>
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<table>
<thead>
<tr>
<th>People in Favela</th>
<th>Population</th>
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<tbody>
<tr>
<td>Favela residents of Brazil’s population</td>
<td>11,400,000</td>
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<tr>
<td>Favela residents of Brazil’s population</td>
<td>6%</td>
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<tr>
<th>Demographics in Favela</th>
<th>Proportion</th>
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<tr>
<td>Non-White</td>
<td>70%</td>
</tr>
<tr>
<td>Illiteracy</td>
<td>8.4%</td>
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</table>
Rio favelas: key facts and figures

- **1,000** – approximate number of favelas in Rio de Janeiro.
- **20** – percentage of the six million people in the city's metropolitan region who live in favelas.
- **3** – times more people killed on average per year by police in Rio than in the entire United States.
- **37** – murders per 100,000 people in Rio per year compared to 1.9 per 100,000 in London.
- **69,300** – number of inhabitants of Rocinha, South America's biggest favela, according to 2010 census.
- **150,000** – estimated approximate true number of inhabitants of Rocinha.
Police in Rio de Janeiro are seeking to take back control of many of the cities main favelas from drug gangs before playing host to matches in the 2014 World Cup and the 2016 Olympic Games.

- **18** – number of favelas that have seen Police Pacification Units (UPPs) installed to drive out crime since the first was established three years ago.
- **40** – number of UPPs police aim to establish by 2014.

Over the past four years, there was a decrease of 26.6% in the rate per 100,000 inhabitants. Records of 40.6 in 2006, fell to 29.8 in 2010.
Rio favelas: key facts and figures

Over the past three years after the implementation of Pacification Police Units (UPP), house prices in the favelas of Rio had a relatively high increase.

The total electricity stolen in a year through illegal connections in the State of Rio de Janeiro would be enough to supply 6.2 million inhabitants of Santa Catarina State for a year.

Rents rose 6.8% in communities more than in other regions of Rio and the appreciation occurs even before the installation of the UPPs.

The company that supplies electricity in Rio de Janeiro loses at least 200 million dollars a year because of the clandestine supply of electricity in the slums.
Main objectives and expected outcomes of the project

- Establishment of an incubator for young entrepreneurs in Rio de Janeiro aimed at designing, developing and implementing water and energy supply models in selected favelas in Rio de Janeiro.

- Project partners will contribute with their expertise in water and energy supply technologies, social sciences, public relations and crisis management, and stakeholder analysis and management.

- Project was submitted on the 31st January 2012 to the funding scheme of Framework Programme 7 (FP7) named “SSH Collaborative projects: small or medium-scale focused research projects” and was categorized under the topic “Social innovation for vulnerable populations”.
Partners involved and their roles

- **Two Slovakian universities**
  - University of Economics in Bratislava (EUBA)
  - University of Žilina (ŽU)
- **Two Czech universities**
  - University of Economics in Prague (VŠE)
  - University of Pardubice (Upa)
- **One Spanish university**: University of Granada (UGR)
- **Two Brazilian universities**
  - Catholic University of Rio de Janeiro (PUC-Rio)
  - Federal University of Espírito Santo (UFES)
- Two Brazilian Environmental consultant companies (CAL & AGENSUS)
- Brazilian Institute of Geography and Statistics (IBGE)
- A Brazilian not-for-profit organization that promotes social innovation campaigns (Benfeitoria).
Partners involved and their roles

- **EUBA:** research institution for test bed and for economic relationships.
- **ŽU:** development and testing of technologies for energy production and exploitation of drinking water using local resources.
- **VŠE:** econometry and business models
- **UPa:** strategic planning for energy and water supply.
- **UGR:** water resources management, economic growth and social development.
- **PUC-Rio:** geotechnical analysis for water supply and for potential ground mount solar PV generation sites.
- **IBGE:** statistical data collection on water and energy supply to households, demography, and security issues.
- **CAL:** Environmental impact assessment.
- **AGENSUS:** stakeholder needs analysis and impact assessment.
- **Benfeitoria:** Develop social innovation campaigns to promote the project and attract additional investors in the form of “patrons”, mainly for the small enterprises incubated.
Technological solutions of the project

The main research objectives of the project are:

- **Technological model**
  - **Mobile Sanitary Unit (MSU)** – as physical product for the provision of water services (bathroom with warm water, WC, drinking water, laundry, sewage deposit). The young people will be directly active on the unit development and its implementation in the favela.
  - **Local Energy Unit (LEU)** – analysis of the possibility for installation of a low cost energy unit based on local energy resource as solar, water, wind or bio energy for the supplying of the group of MSU with independent energy system.
Technological solutions of the project

Hydropower on water wheel principle with a low gradient installed in Slovakia

Economy model of the equipment for electricity is demonstrated on comparison

<table>
<thead>
<tr>
<th></th>
<th>Classic turbine</th>
<th>Water wheel</th>
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<tbody>
<tr>
<td>Initial costs</td>
<td>100 000 €</td>
<td>25 000 €</td>
</tr>
<tr>
<td>Operating capacity</td>
<td>100 kW</td>
<td>50 kW</td>
</tr>
<tr>
<td>Total effectiveness</td>
<td>1 000 €/1 kW</td>
<td>500 €/1 kW</td>
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<tr>
<td>Cost saving for 1 MW</td>
<td>0%</td>
<td>+ 50%</td>
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Technological solutions of the project

**Solar powered mobile units**: the panels convert the solar energy to electrical energy and the batteries store the energy.

**Bioenergy** – an interesting and convenient low-cost source together with significant environmental aspects when municipal waste is used on its acquisition.

**Wind power** - more costly alternative in comparison with other local resources but can be appropriate in areas with continuous air flow or for short-term use.
Social innovation of the Project

- **Couching and training** of groups of young people in project management as a problem solution tool and assessment of opportunities of local natural resources for water and energy supply.

- **Business Unit (BU)** – development of a model of business unit for young people from favela for the supply of water services to the favela inhabitants. In each MSU it is expected that at least 2 full-time jobs will be generated.
Main steps of the project

Graphical presentation of the components showing their interdependencies

CONSORTIUM

EU Partners

Reference model MSU and BU

Redesign of MSU and BU

Technology preparting and testing

Brazil Partners

1st Communication training

Incubator and Lectors

Youth of Favela

Implementation of the MSU and BU

2nd Communication training

Supervisors
Main steps of the project

First stage – Research and preparation:
- Develop the Incubator Trainings System with the mentors and experts.
- Provide training participants with the aspects of existing different sanitary technologies for exploitation of water supply and electricity from local resources and also generate opportunities to create own business plan on how to operate such facilities.

Second stage – Trainings
- Development of proposals by each team of their own business units based on situation analysis of the favela.
- Assessment of opportunities and definition of possible obstacles and threats.
- Presentation of proposals by each team in front of their mentors.
Main steps of the project

The third stage – Development

- Preparation of a technological solution for a specific location of favela in cooperation with experts from consortium.
- Creation of these solutions will be held in EU countries. Teams will be invited from Brazil to the laboratories where the solutions will be conceived for electricity and water supply.

The last phase – Implementation

- Technological solutions will be installed and simultaneously the final stage of training will take place for assuring full economic operation of the equipment.
- Preparation of teams to be able to implement their own business plans.
### Main steps of the project

**Work Packages:**

- **WP 1:** RTD – Primary research of favela environment and preparation of reference model
- **WP 2:** RTD – Preparation of the Incubator - Training system and international couches team
- **WP 3:** RTD – Realization of the 1\(^{st}\) training stage in Brazil – analytical and conceptual stages
- **WP 4:** RTD – Redesign of the Business Unit and Mobile Sanitary Unit by the experts
- **WP 5:** OTHER – Production and testing of Mobile Sanitary Unit and team excursions in EU
- **WP 6:** DEM – Implementation of the pilot Mobile Sanitary Units in favela Brazil
- **WP 7:** DEM – 2\(^{nd}\) training stage – Mobile Sanitary Unit operation and business plan
- **WP 8:** MGT – Management
Main steps of the project

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I warmly invite you to visit our International Sustainability Network CRUSUS
www.crusus.org

THANK YOU FOR YOUR ATTENTION!

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