



SWTOMP

Project presentation

Speaker:
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SWTOMP Workshop at the course
**Minieólica para autoconsumo:
Sistemas eólicos distribuidos y aislados**



Montevideo, Uruguay – Octubre 2019



SWTOMP Project

- The main objective of the **SWTOMP** project is **the promotion, development and implementation of the utilization of small and medium size wind turbines for isolated applications and for connection to weak grids**, including the optimization of small/medium-scale wind turbines to meet local wind regimes and regional infrastructure requirements
- Total duration of the project is three years (2016 – 2019)

SWTOMP Project

- It is a project organized under the umbrella of the ERANET_LAC European Program that was approved in November 2016
 - Each partner has its own national funding
 - Each partner has a different time schedule
 - Total estimated cost: 1.14 M€ (0.64 M€ requested funding)

SWTOMP Project

The main expected results are:

- Closer inter-regional links between R&D institutions, wind turbine manufacturers, policy makers and end-users.
- Increased awareness of small/medium-scale wind turbines
- Development of new wind turbines designed specifically for tropical and cool environments

SWTOMP – Consortium members

The following institutions participate in the project:

- **CIEMAT** - Spain - **Coordinator**
- **INEEL** (Instituto Nacional de Electricidad y Energías Límpias) – Mexico
- **INTEC** (Instituto Tecnológico de Santo Domingo) – Dominican Republic
- **INTI** (Instituto Nacional de Tecnología Industrial) Neuquén - Argentina
- **IZTECH** (Izmir Institute of Technology) – Turkey
- **UdelaR** (Universidad de la República) – Uruguay
- **UTCN** (Universitatea Tehnica din Cluj-Napoa) - Romania
- **VTT** (Technical Research Centre of Finland Ltd) -Finland



Working Packages structure

WP Number	Work Package Title	TASK Number	Task Name
WP0	Project Management	Task 0.1	Management of the Project
WP1	Promotion of SWT Market	Task 1.1	Analysis of the market of SMWT
		Task 1.2	Workshops for Market Promotion
		Task 1.3	Preparation of material for education
WP2	Wind Resources for SWT	Task 2.1	Assessment of the wind resources in six locations
		Task 2.2	Methodology for easy assessment of local resources
WP3	Wind Turbines Optimization	Task 3.1	Selection of SWTs to be optimised
		Task 3.2	Redesing of the SWT
		task 3.3	Manufacture and installation of prototypes
		Task 3.4	Testing and Certification of SWT
		Task 3.5	Analysis of results
WP4	Standard for SWT	Task 4.1	Identification of standards improvements
		Task 4.2	Proposal for IEC 61400/2 Modification

Gantt Diagram

WP Number	Work Package Title	TASK Number	Task Name	YEAR 1				YEAR 2				YEAR 3							
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
WP0	Project Management	Task 0.1	Management of the Project	[Gantt bar spanning all 12 quarters]															
WP1	Promotion of SWT Market	Task 1.1	Analysis of the market of SMWT	[Gantt bar: Q1-Q3]															
		Task 1.2	Workshops for Market Promotion					[Gantt bar: Q3-Q4]											
		Task 1.3	Preparation of material for education	[Gantt bar: Q1-Q4]															
WP2	Wind Resources for SWT	Task 2.1	Assessment of the wind resources in six locations					[Gantt bar: Q2-Q3]											
		Task 2.2	Methodology for easy assessment of local resources					[Gantt bar: Q3-Q4]											
WP3	Wind Turbines Optimization	Task 3.1	Selection of SWTs to be optimised	[Gantt bar: Q1-Q2]															
		Task 3.2	Redesing of the SWT					[Gantt bar: Q2-Q3]											
		task 3.3	Manufacture and installation of prototypes					[Gantt bar: Q3-Q4]											
		Task 3.4	Testing and Certification of SWT									[Gantt bar: Q3-Q4]							
		Task 3.5	Analysis of results									[Gantt bar: Q3-Q4]							
WP4	Standard for SWT	Task 4.1	Identification of standards improvements					[Gantt bar: Q1-Q2]											
		Task 4.2	Proposal for IEC 61400/2 Modification									[Gantt bar: Q2-Q4]							



WPO. Project Management

WP Leader: CIEMAT

The WPO is related with the general financial and scientific issues of project management including aspects concerning the cooperation between ERANET_LAC officers and the project consortium.

Main Deliverables:

- *Web creation:*
<http://swtomp.ciemat.es/>
- *Annual Progress Reports*
- *Final Report*

Small Wind Turbines Optimization and Market Promotion **SWTOMP**

PROJECT WORK PLAN PROGRESS DISSEMINATION NEWS/EVENTS PRIVATE AREA

Proyecto SWTOMP (Small Wind Turbine Optimization and Market Promotion) / inicio /

SWTOMP PROJECT

The main objective of the SWTOMP project is the promotion, development and implementation of the utilization of small and medium size wind turbines for isolated applications and for connection to weak grids, including the optimization of small/medium-scale wind turbines to meet local wind regimes and regional infrastructure requirements.

Ceder Instituto Nacional de Meteorología y Sismología Universidad de La República Uruguay TECHNICAL UNIVERSITY INTI VTT

REGEDIS first meeting

2018 annual meeting in Mexico

WP1. Promotion of the Potential Market

WP Leader: CIEMAT

The objective is the promotion, development and implementation of the utilization of small and medium size wind turbines

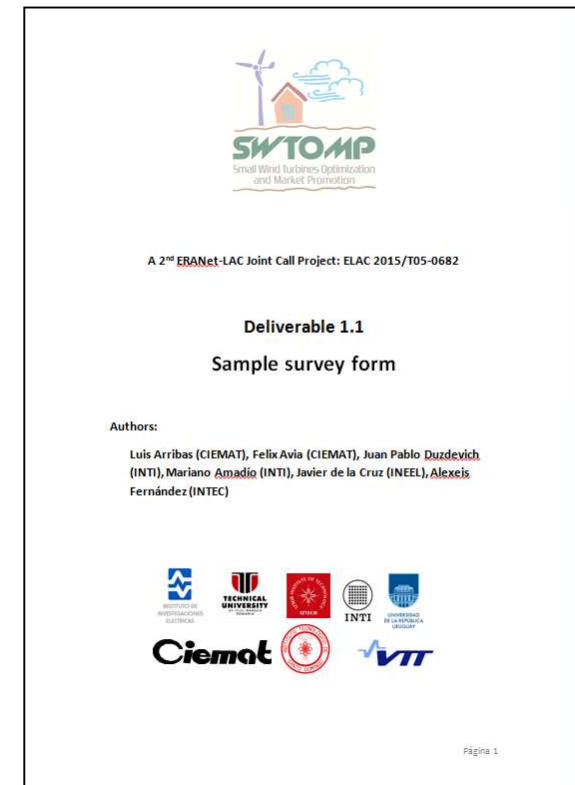
- Task 1.1 Analysis of the market
- Task 1.2 Workshops
- Task 1.3 Preparation of material for education of researches, technical and users

WP1. Promotion of the Potential Market

Task 1.1 Analysis of the market

Deliverable 1: Sample survey form

- Five scopes have been identified in relation to the characterization of the market of SWT:
 - the market deployment assessment,
 - the market suitability assessment,
 - the practical aspects of SWT market,
 - the social aspects of SWT market and
 - the regulatory issues of SWT market.
- SWTOMP: not one, but several sample survey forms (INTI, INEEL, CIEMAT)



WP1. Promotion of the Potential Market

Task 1.1 Analysis of the market

Deliverable 2: Sample survey results

- Existing results coming out from previous surveys
- Results for SWTOMP countries
 - Different levels of detail
 - México and Argentina, detailed
 - Finland, Spain, Dominican Republic, more general
 - Different levels of deployment:
 - Uruguay, very low
 - Finland, Spain, middle
 - Argentina, quite high
 - Different level of accomplishment
 - México, Finland and Argentina, finished
 - Spain, on-going

WP1. Promotion of the Potential Market

Task 1.2 Workshops

Deliverables: Workshops for information

6/2018: Huatulco, Mexico

http://projects.ciemat.es/web/swtomp/cont_dest4



10/2018: Soria, Spain, in REGEDIS week

http://projects.ciemat.es/web/swtomp/cont_dest5



10/2019: Montevideo, Uruguay

¡¡HOY!!

WP1. Promotion of the Potential Market

Task 1.3 Preparation of material for education of researches, technical and users

Deliverable: Educational material edition

- Different materials for different target audiences
 - Available resources mapping
 - Elaboration of a guide to navigate through these resources
 - New educational material: technically oriented

WP2. Development of methodology for evaluation of wind resources for SWT

WP Leader: IZTECH

The objective is to develop a methodology for easy assessment of the wind resources in potential locations for the use of SWT

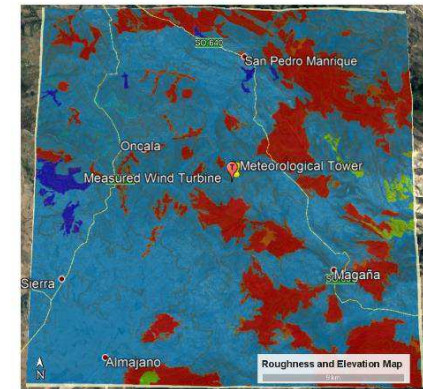
Task 2.1 Use of existing codes for assessment of the wind resources in four locations and verification of the results

Task 2.2 Description of the methodology for easy assessment of local resources using the available information (data bases, etc.)

WP2. Development of methodology for evaluation of wind resources for SWT

Task 2.1 Use of existing codes for assessment of the wind resources in four locations and verification of the results

- 2 sites comparison (in Turkey and Spain)
- 4 technical visits (Turkey)



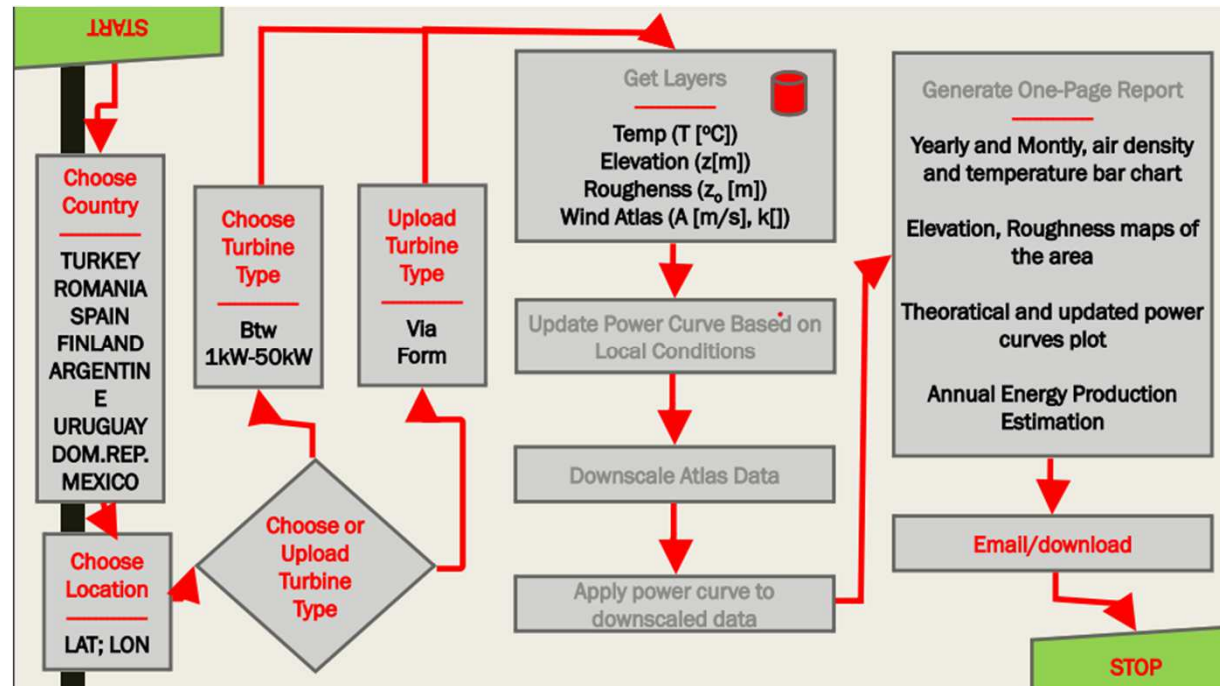
Conclusions

- Models are good enough for AEP calculations but not good enough to model obstacles. Small turbines gets effected from local roughness significantly (*A simplified method on estimation of forest roughness by use of aerial LIDAR data*)
- Problems for the SWT users are
 - Site assessment; due to cost, accessibility
 - Regulations and standards; changes all the time, not helpful
 - Initial cost and unexpected lower production.

WP2. Development of methodology for evaluation of wind resources for SWT

Task 2.2 Description of the methodology for easy assessment of local resources using the available information (data bases, etc.)

- Structure for an Easy Assessment Tool (EAT)
- A fence modeling experiment
- A building integrated experiment



WP3. Optimization of SWT

WP Leaders: INEEL and INTI Neuquén

The objective is the optimization of two small turbines to meet local wind regimes and regional infrastructure requirements

Task 3.1 Selection of the SWTs to be optimized for cool sites and tropical sites

Task3.2 Redesign of the SWT

Task3.3 Manufacture and installation of the prototypes

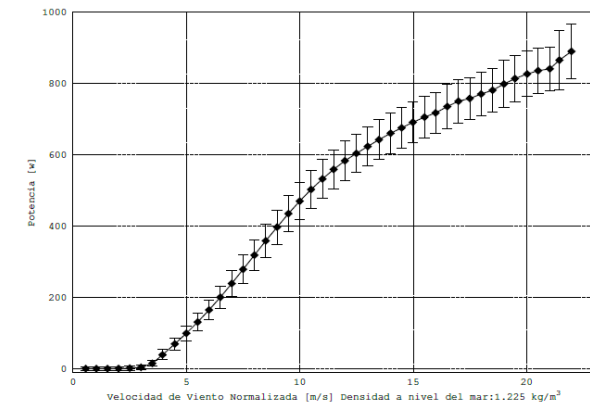
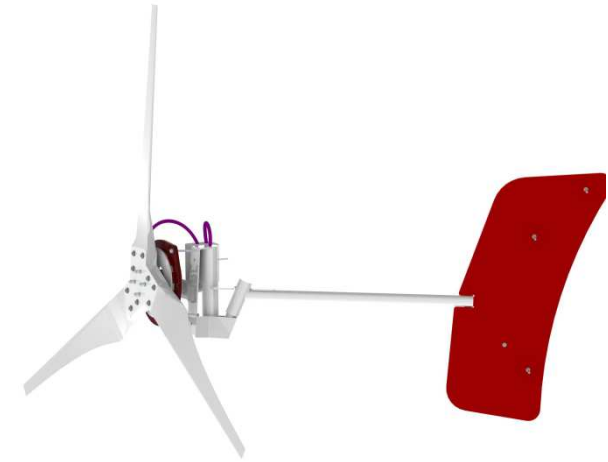
Task 3.4 Testing and certification of the SWT

WP3. Optimization of SWT.

SWTs to be optimized for cool sites

Eolocal Wind Turbine

- Argentinian manufacturer
- Based on Hugh Piggot's design
- 1000 W
- Battery charging model tested at INTI
- Interest in grid tied model:
 - PV Grid Inverter (1kW)
 - Chinese made
 - Matching to the SWT



WP3. Optimization of SWT.

SWTs to be optimized for tropical sites

Aeroluz Wind Turbine

- Mexican manufacturer
- Tower:
 - 18 meters
 - 3 sections
 - Galvanized steel
- Grid Inverter (6kW)
 - Range input operating: 50-580 V
 - Max. Input Current 36 A
 - Input voltage at full power: 200-580
 - Max. Continuous output power: 6000W@ 50°C
 - Frequency range: 59.3-60.5 Hz
 - Power factor: >0.995
 - Nominal output voltage: 277 V/240 V/208 V



WP4. Standards for SWT

WP Leader: CIEMAT

The objective is to improve the existing standards for design of SWT

Task 4.1 Identification of Standards Improvement.

Task 4.2 Proposal for IEC 61400/2 Modification.

Deliverables: Summary of the improvements identified /
Proposal for IEC 61400/2 Modification



Thank you!

Ciemat

