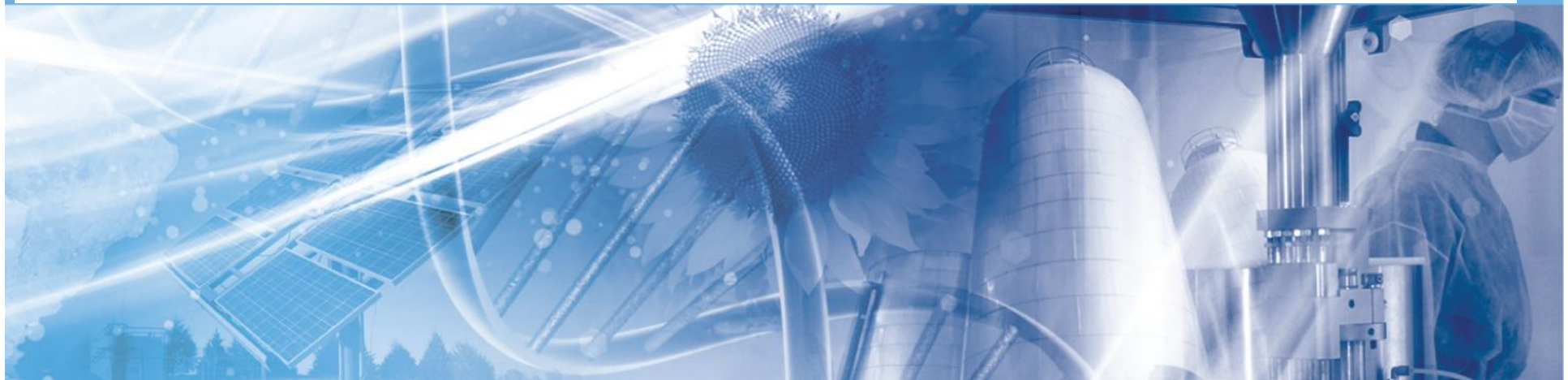


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INTI National Institute of Industrial Technology, Argentina.
Laboratory of Wind Energy
Ing. Andrea Rivarola

Latin American Wind Energy Forum: Wind energy markets in Argentina, Brazil and Uruguay
WINDENERGY Hamburg Germany, 23 –26 September, 2014



INTI National Institute of Industrial Technology. Argentina

OBJECTIVES AND AIMS

- ✓To promote the generation and transfer of technological innovation to industries
- ✓To ensure that the quality of processes, goods and services complies with global standards and trends.
- ✓To perform activities in its capacity as certifying agency of standards and specifications, and disseminator of knowledge and technology practices.

ACTIVITIES

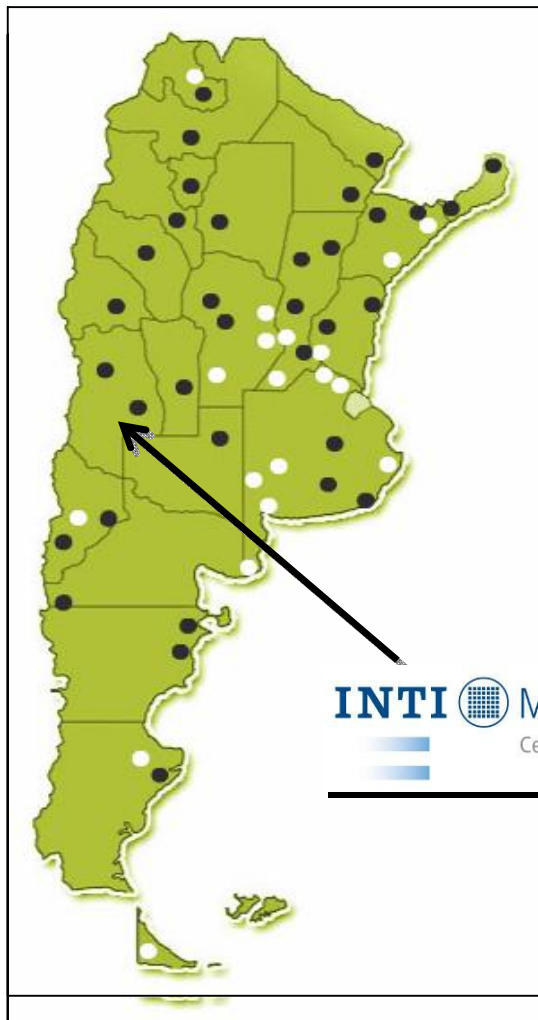
- ✓Technology services such as analysis, testing, certification, calibration.
- ✓Technical assistance such as audits, research and development, consulting and training.
- ✓Extension activities as a modality oriented to relatively less developed sectors.



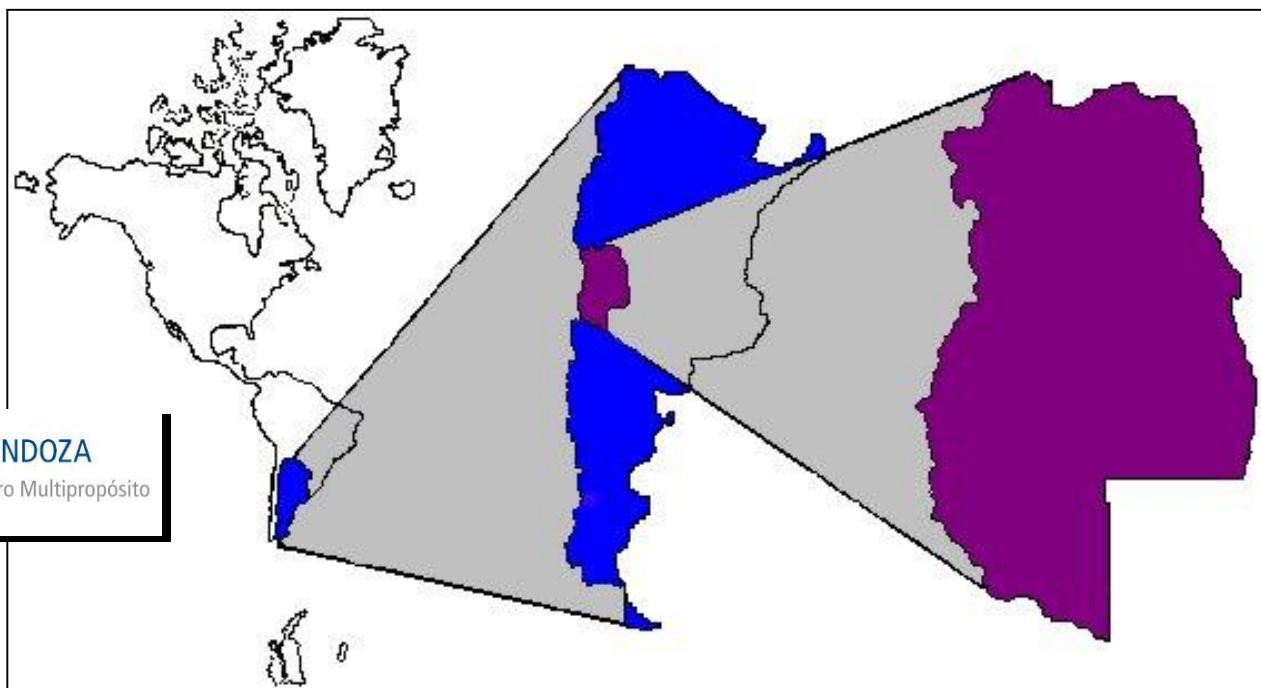
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INTI

REGIONAL CENTER – INTI MENDOZA



INTI  MENDOZA
Centro Multipropósito





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REGIONAL CENTER – INTI MENDOZA



Aráoz 1511 y Acceso Sur – Luján de Cuyo – Mendoza.

Telefax: (54-261) 4-961840 / 0702 / 0400 (Int 105)

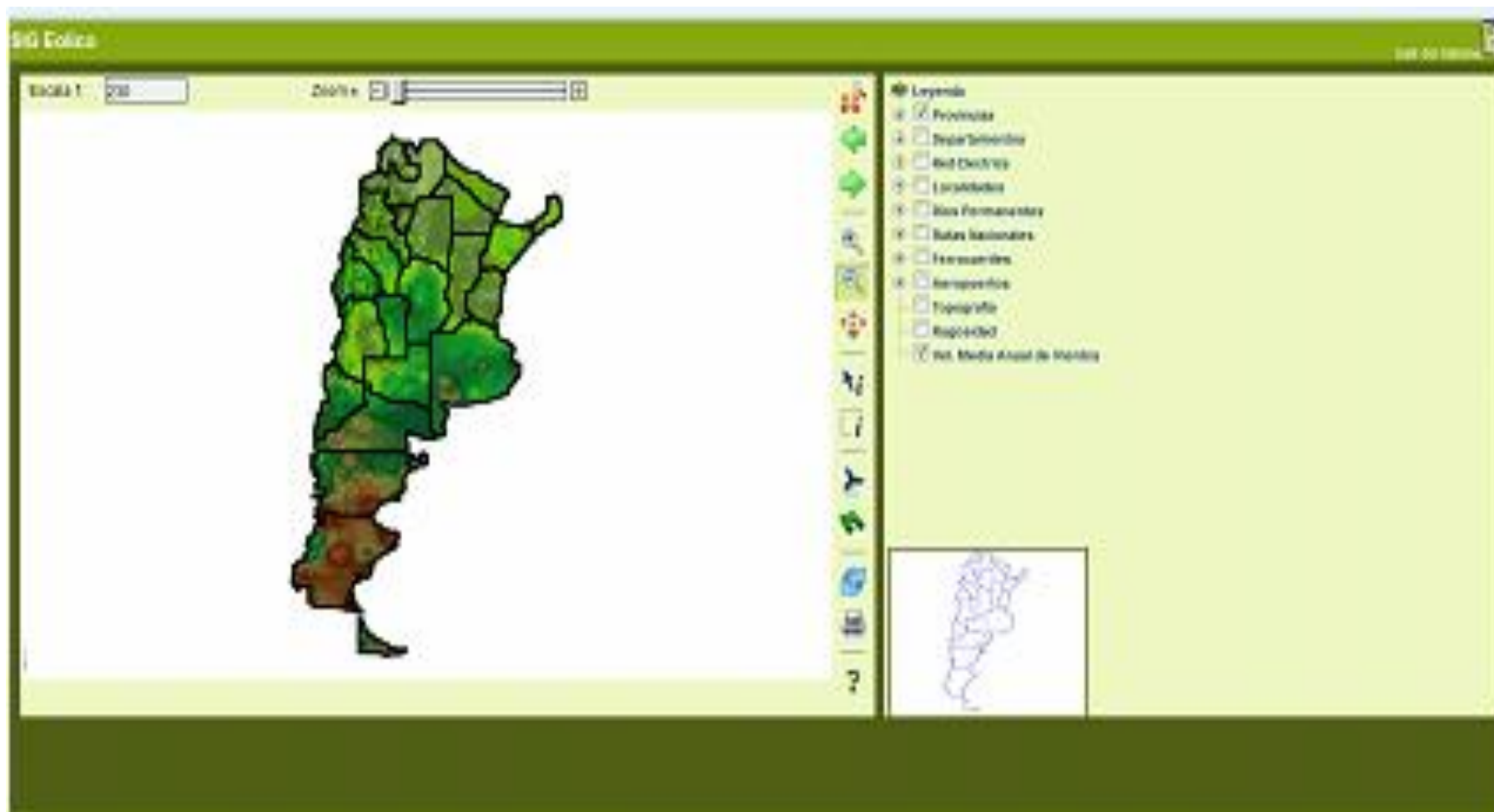
intimza@inti.gob.ar



INTI

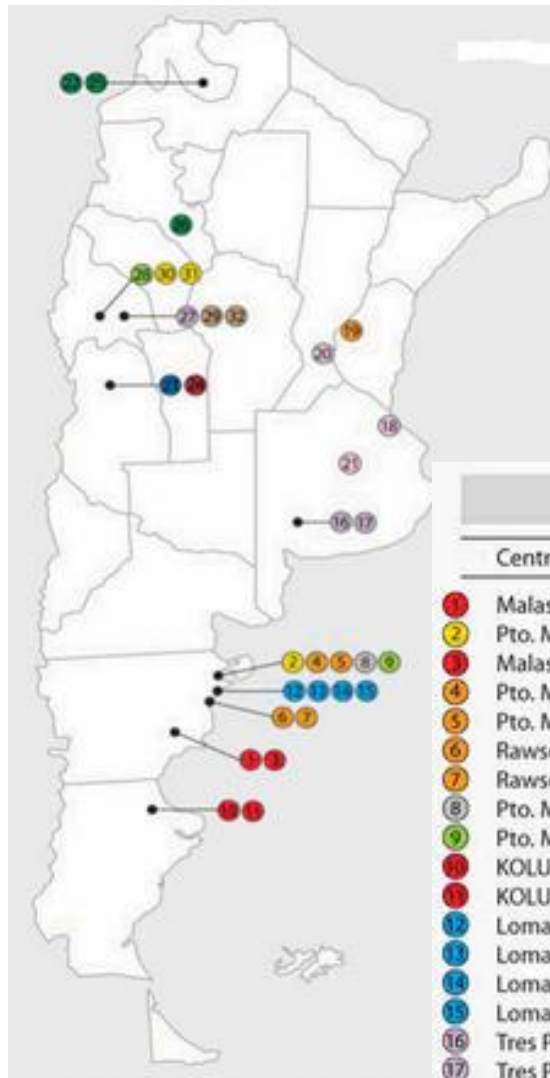
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ARGENTINIAN GIS BY CREE (CHUBUT)





WIND IN PARKS IN ARGENTINA



Eólica			
Central	Proponente	Potencia MW	
1	Malaspina I	IMPISA	50,0
2	Pto. Madryn Oeste	Energías Sustentables S.A.	20,0
3	Malaspina II	IMPISA	30,0
4	Pto. Madryn II	Emgasud Renovables S.A.	50,0
5	Pto. Madryn I	Emgasud Renovables S.A.	50,0
6	Rawson I	Emgasud Renovables S.A.	50,0
7	Rawson II	Emgasud Renovables S.A.	30,0
8	Pto. Madryn Sur	Patagonia Wind Energy S.A.	50,0
9	Pto. Madryn Norte	International New Energies S.A.	50,0
10	KOLUEL KAIKE I	IMPISA	50,0
11	KOLUEL KAIKE II	IMPISA	25,0
12	Loma Blanca I	Isolux S.A.	50,0
13	Loma Blanca II	Isolux S.A.	50,0
14	Loma Blanca III	Isolux S.A.	50,0
15	Loma Blanca IV	Isolux S.A.	50,0
16	Tres Picos I Básica	Sogesic S.A.	49,5
17	Tres Picos II Básica	Sogesic S.A.	49,5





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WIND ENERGY IN INTI

Laborary of Wind Energy

INTI Mendoza

Wind Turbine Noise

Wind Turbine Sound Power Determination according to
IEC61400–11

Laborary of Wind Energy

INTI Neuquén

Power performance testing of small wind turbines (500 W to 10
Kw), according to IEC61400-12.

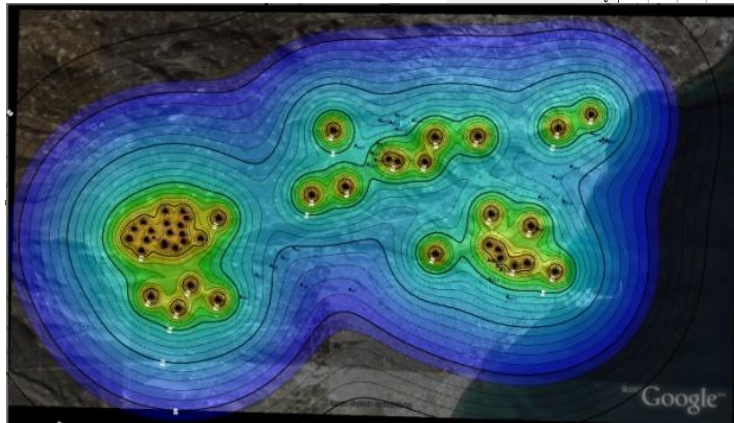
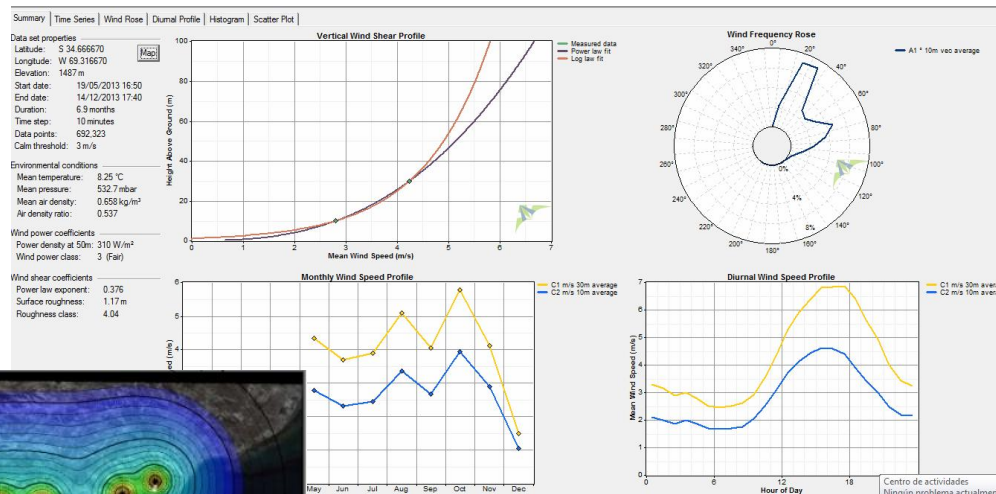
LABORATORY OF WIND ENERGY–MENDOZA. ARGENTINA

OBJECTIVES

- ✓To attend to the national industry need related to wind energy.
- ✓To carry out acoustic noise measurements in Argentinean wind parks.
- ✓To develop a national standard for wind turbine noise in Argentina, based on international standard (IEC 61400–11).
- ✓To promote the Wind Turbine Sound Power Determination in Argentina.
- ✓To achieve the national certification on wind energy noise through INTI.

INTI National Institute of Industrial Technology – Argentina Wind Energy Laboratory INTI Mendoza

- Assessment of wind resource in isolated places of Mendoza, Argentina.
- Wind Turbine Noise Training Courses to Wind Turbine Manufacturer in Argentina.
- Life Cycle Assessment (LCA) Methodology applied to Wind Turbines.
- Development of Noise Impact Indicators.





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INTI

Project: Small wind power generation system to provide clean electric energy in an isolated area located in San Carlos, Mendoza–Argentina. INTI Mendoza



Project: Small wind power generation system to provide clean electric energy in an isolated area located in San Carlos, Mendoza–Argentina.



PROJECT STEPS

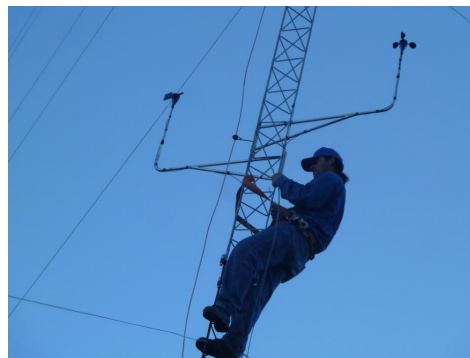
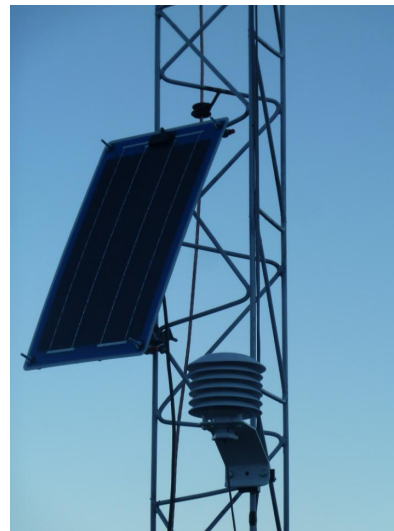
1. Establishment of a Weather Station in La Jaula, San Carlos.
2. Assessment of Measured Data (temperature, wind speed, wind direction, pressure).
3. Assessment of VORTEX data.
4. Assessment of Wind Resource in La Jaula, San Carlos.
5. Assessment of different Wind Turbines Power.
- 6. Monitoring of Meteorological Station in La Jaula, San Carlos.**
- 7. Measurement of wind turbine noise.**



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ESTABLISHMENT OF A WHETHER STATION IN LA JAULA, SAN CARLOS

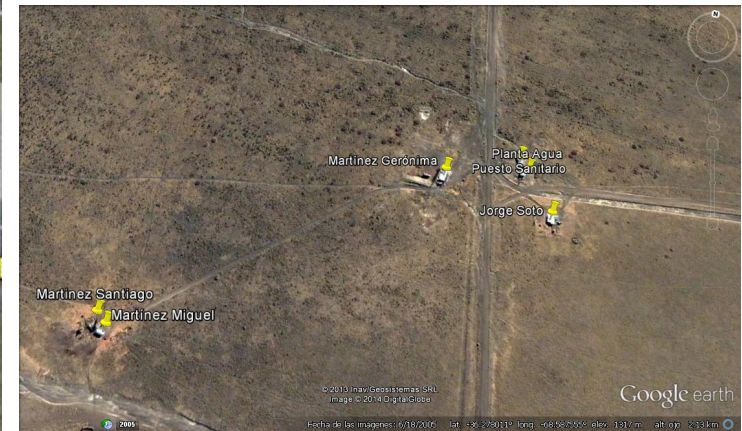




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INTI

Project: Evaluation of wind resource for processing Guanaco Wool in Salinillas, Mendoza–Argentina. INTI Neuquén

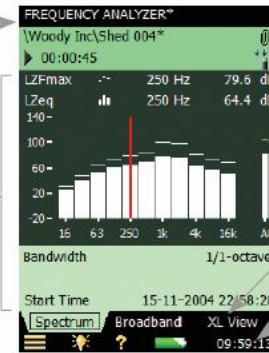




Plantilla del proyecto seleccionado (incluye configuración de visualización y medida)

Zona de visión:

- Contiene todos los parámetros y resultados en formato numérico o gráfico
- Posibilidad de utilizar más de una vista para mostrar la información
- Seleccionar vista mediante Tabulación de vistas en el botón de zona de visión

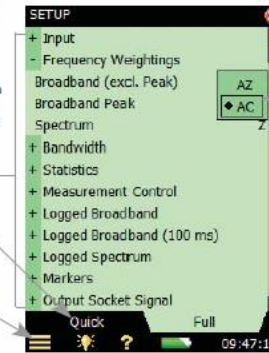


Campo de estado:

- Nombre y ubicación del proyecto
- Respuesta inmediata al botón pulsado
- Información sobre el estado de la medida

Barra de tareas:

- Botón de menú principal, brillo, ayuda, nivel de batería, reloj



Cierra y vuelve a la medida

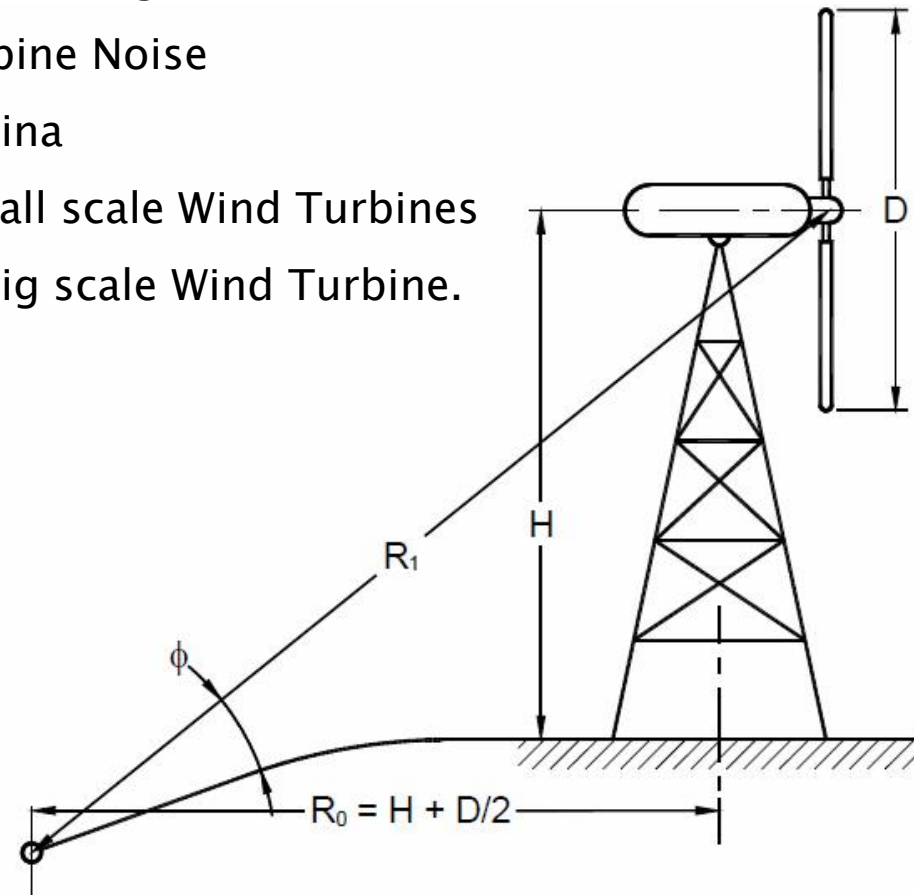
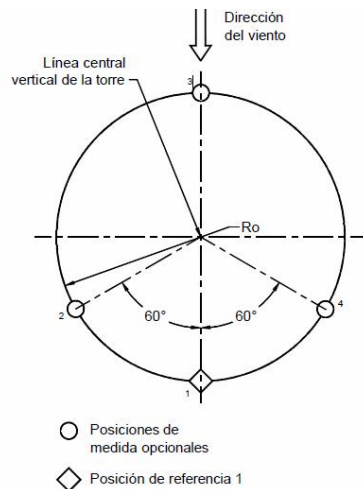
Parámetros:

- Cambio mediante despleables
- Elemento activo resaltado

WIND TURBINE NOISE

- ❖ Course on Wind Turbine Noise in IMPSA WIND
- ❖ Study of wind turbine noise emission according to IEC 61400-11.
- ❖ Prediction and Assessment of Wind Turbine Noise
- ❖ Advise on Wind Turbine Noise in Argentina
- ❖ Measurement Wind Turbine Noise in small scale Wind Turbines
- ❖ Measurement Wind Turbine Noise in a big scale Wind Turbine.

PROTOTYPE



Project: Assessment of Wind Turbine Noise IWP 2.1 MW. Arauco Park, La Rioja Mendoza

- Arauco Wind Park SAPEM [Goverment of La Rioja (75%) y ENARSA (25%).
- ARAUCO I. Installed Capacity : 50,4 MW**
- IWP 2,1 MW PROPOTYPE MODEL**





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NOISE IMMISSION FROM WIND FARM



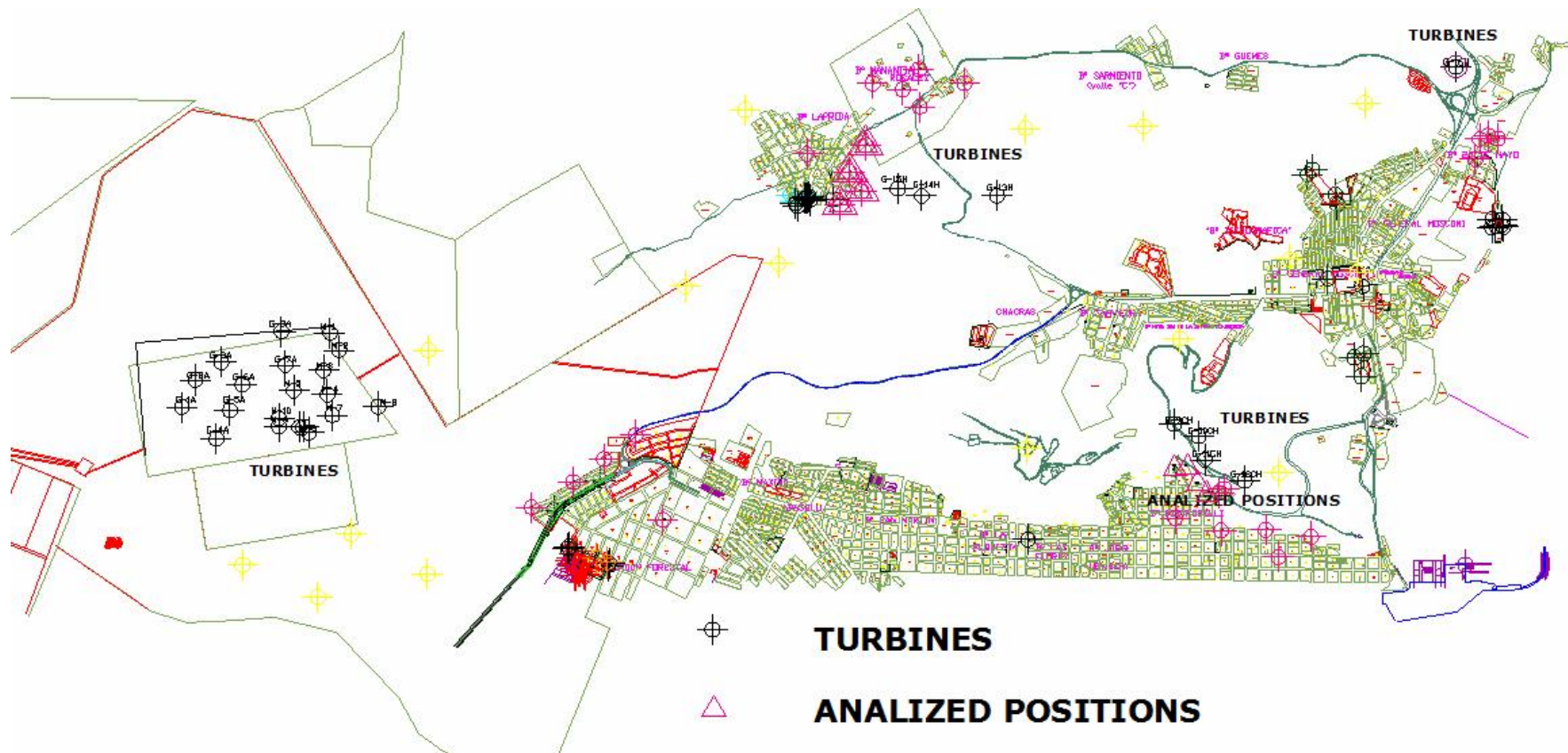
C° Arenales View - Antonio Morán Wind Park – Comodoro Rivadavia – Chubut - Argentina



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INTI

NOISE IMMISSION FROM WIND FARM



_Map of the city with location of equipments and analyzed positions

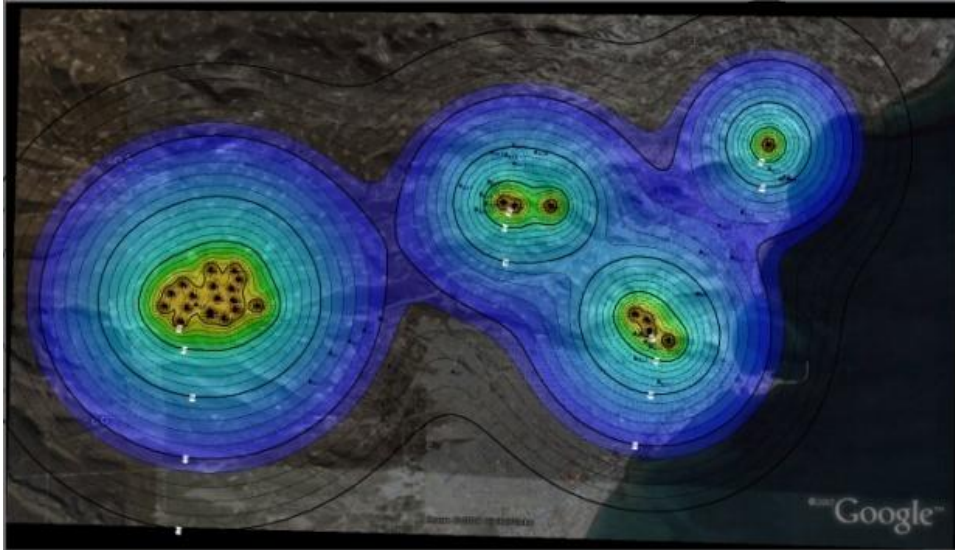
Antonio Morán Wind Park – Comodoro Rivadavia – Chubut - Argentina



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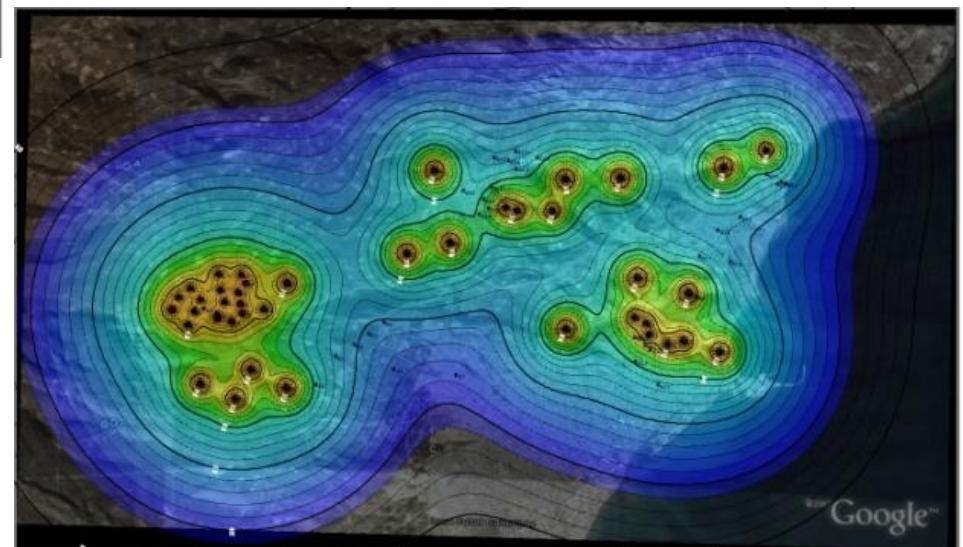
INTI

NOISE IMMISSION FROM WIND FARM



Current A. Morán Park - 26 equipments

Expansion of A. Morán Park - 42 equipments

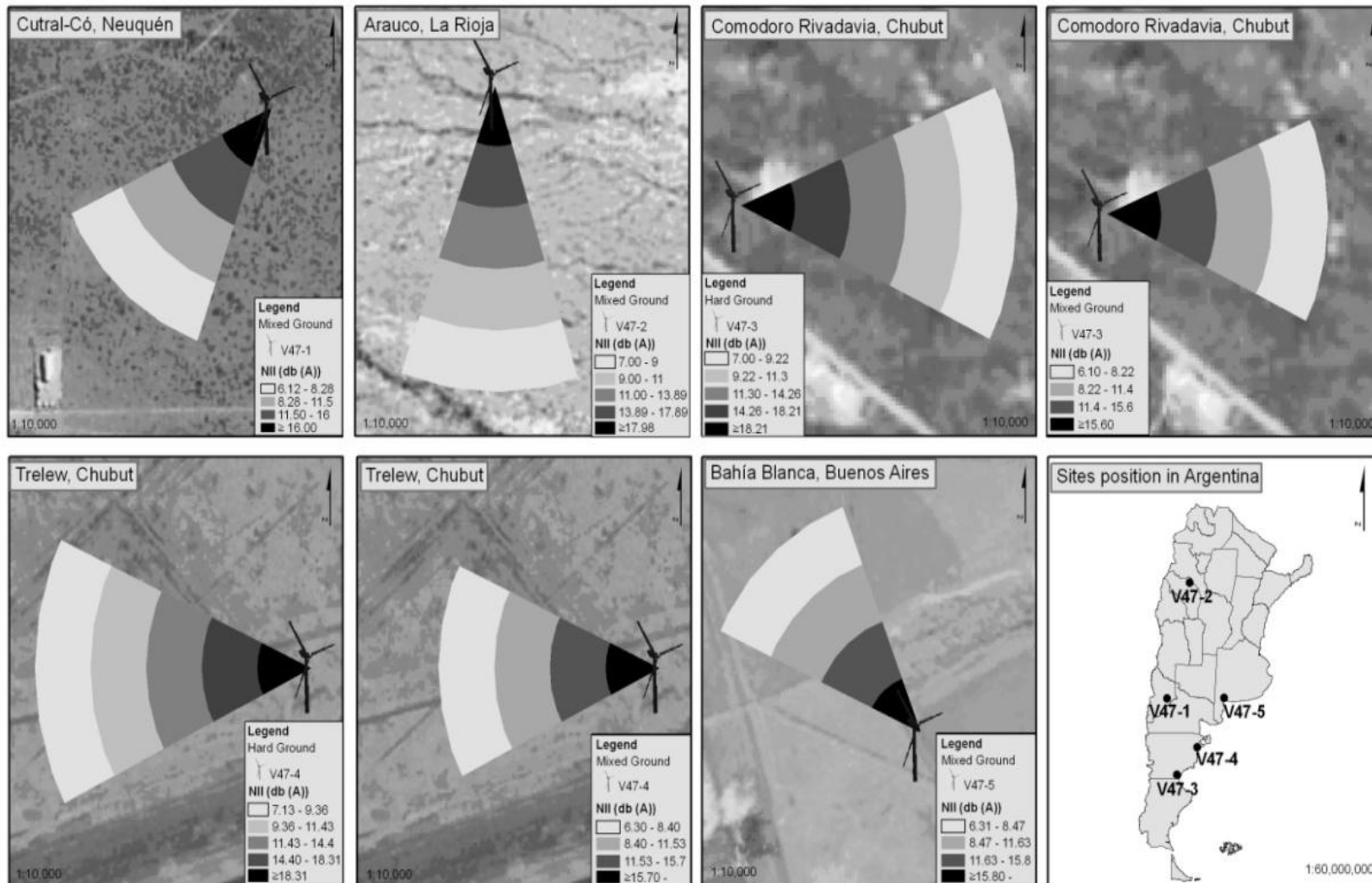


DEVELOPMENT OF NOISE IMPACT INDICATOR (NII)

- Noise Emission according to IEC 61400-11
- Noise Immisión ISO 9613-2
- Source characteristic: Turbine type and Local character.
- Acoustic mechanisms such as Geometrical divergence, Air absorption and Ground effect, etc
- Presence of barriers, by the effect of vegetation or different topographies.
- Weather_conditions: Temperature, Pressure, Wind Speed, Wind Direction, etc
- Geographical location: the nearest to the urban center
- LCA framework



DEVELOPMENT OF NOISE IMPACT INDICATOR



TO SUM UP

1° STEP MEASUREMENT OF WIND TURBINE NOISE

EMMISSION

FIELD TEST

2°STEP ASSESSMENT OF WIND TURBINE NOISE

IMMISSION

SIMULATON TEST

3° STEP DEVELOPMENT OF NOISE INDICATOR FOR WT IN ARGENTINA.

AS A COMPLEMENT OF WT PLANIFICATION/LOCATION

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