



Q U J # \$ d w d j r q l d # F r p s d q |

An Argentinean Private Company  
from Patagonia

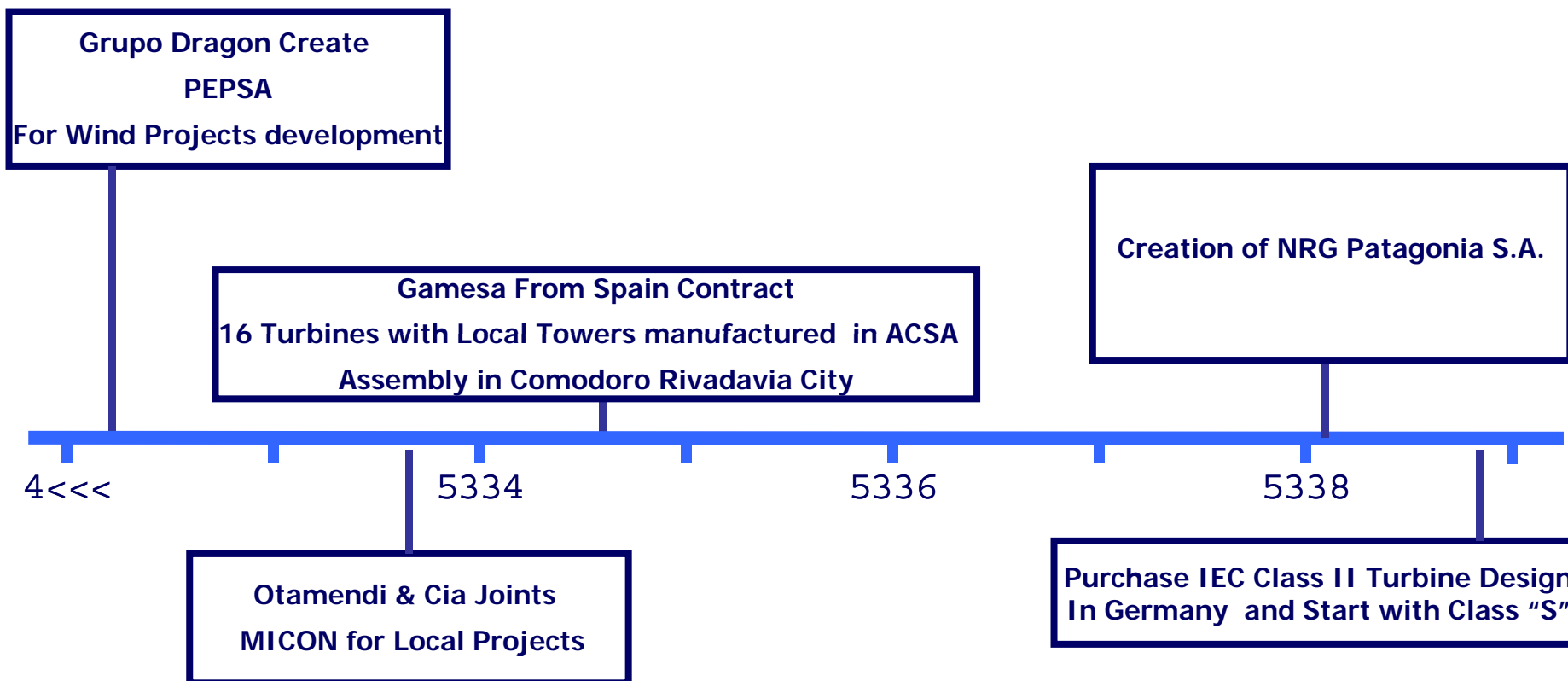


### The Shareholders

- ▶ Grupo Cerro Dragon
- ▶ Otamendi y Cia.
- ▶ Ingeniero Leopoldo E. Bressan
  - Astilleros Comodoro S.A.  
Usually Named **ACSA**



# K I W R U



R xu#Jrøbj#P dfk.bh#  
Wr#Ehgg#Søwhv#X qwl#B 13#p #Z lgwk#Dagg#5õ#WkIfnqhw





Z runvkr



Dxwꝛp dꝛf#Z hꝛg bꝛj#P dꝛk.bꝛh



Iwz dvgrw#hdv|#wr#gr#kh#re



Ilgkghg#wrz hu



13 14:18



F r q f u h w h # I r x q g d w t r q v #







Dwhp ed rqr#7#g lthuhqw#7whv





Vwduwlgj#z runv#



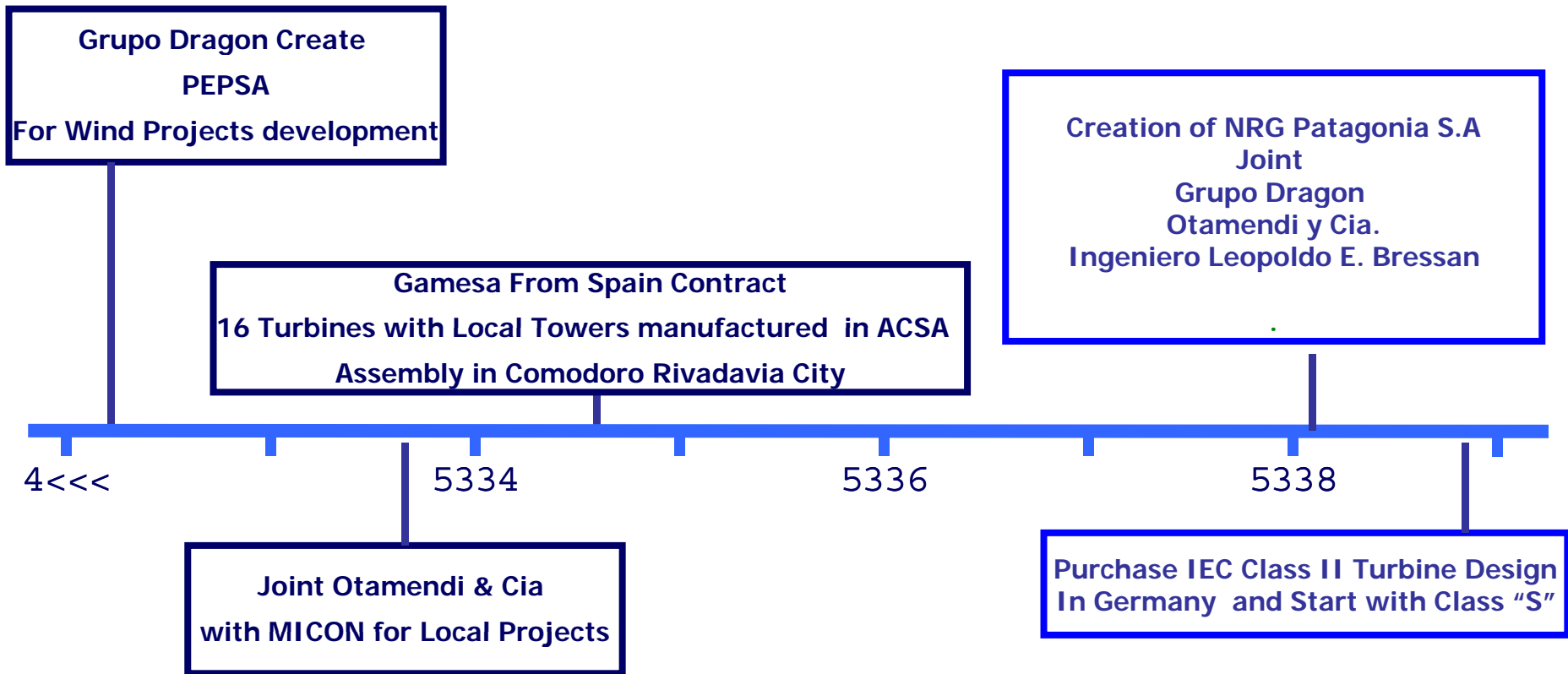
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► Usual issues we observed

- Many European turbines had different problems, such as broken **blades** (because there weren't resistant enough, or because they bended so much that collide with the tower), Broken and fallen Towers, Broken Yaw Gear Rims teeth , Broken Gear boxes, etc.–
- There's always been an unavoidable **dependence of the European support**, technicians that must travel from far away, the wasted time waiting for them because they were not immediately available, changes rates in money transaction currencies between South America and Europe that makes it expensive to repair or to buy the broken part; not having enough spare parts available in the region, etc. -





- ▶ To create The NRG 1500 KW IEC Class S
    - Our goal: To develop a **simple machine**
      - Since the park locations are far away from the big cities, we thought it should be **one mechanical , not electronic Turbine**, to avoid electronic technicians.

A person with mechanical skills is easier to find, and also easier to be trained
    - A machine with parts that can be **manufactured in our country** with existent suppliers
    - A machine that **doesn't require heavy cranes of excessive capacity**, since there are only a few of them in our region, and their transportation costs are very expensive.
- For the assembly we should use the cranes that already exist in the area. –
- A machine designed with **existent first quality technology**.

***An existent machine, already certified and tested.***





Wkh#rup hu##G DVZ IQ G #Whdp

- ▶ So we decided to ask for advise to a German Engineers Group , dedicated to design turbines with wide experience inside and outside Europe.
- ▶ In February of 2006, NRG Purchased the rights of the design of the Wind Turbine 1,5 MW Class II, an existing turbine already certified, tested and designed by a German Company named IDASWIND.





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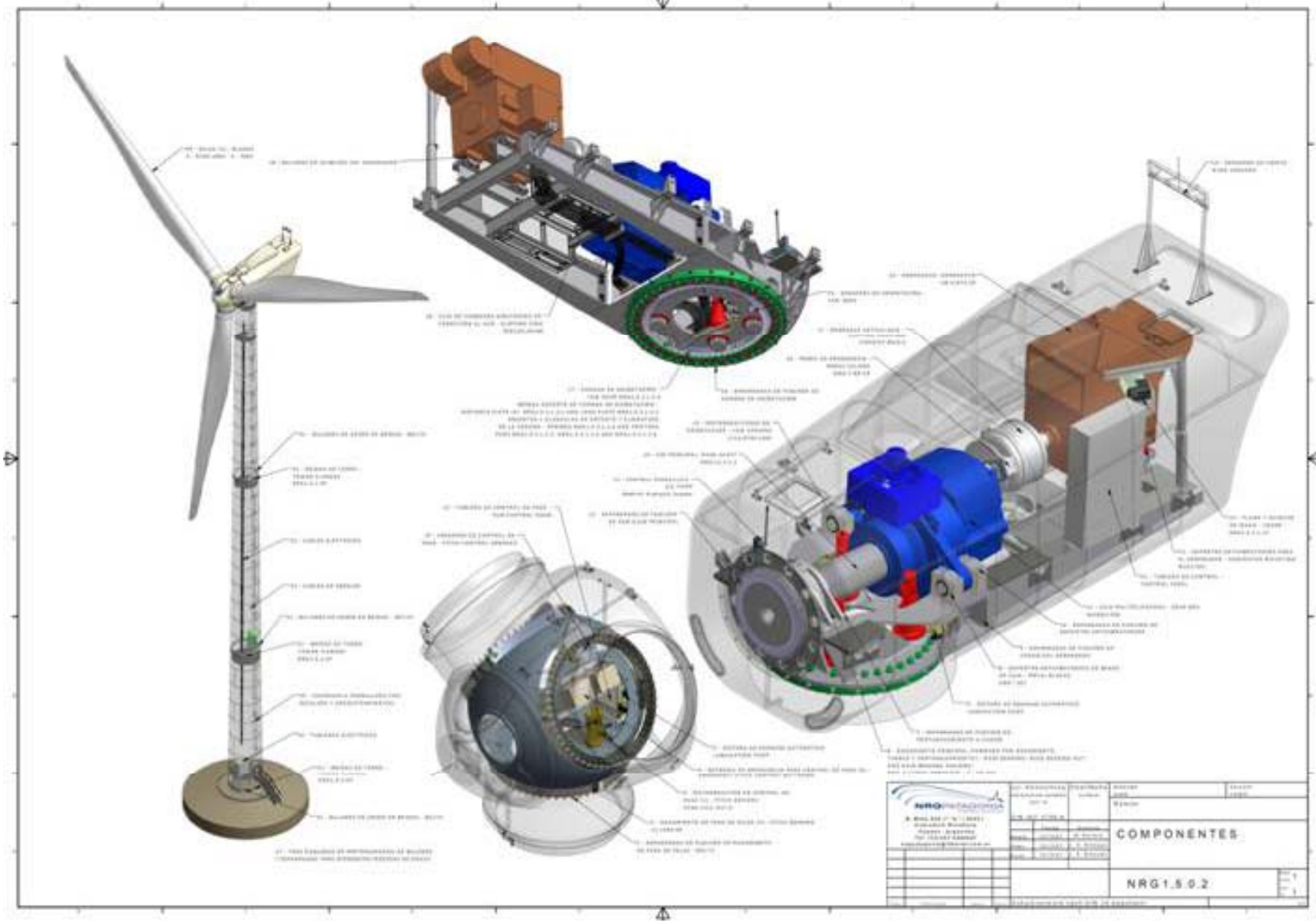
# FOLV#ŠVŮ#HF #L ,#Q UJ #1833

## Q UJ #1833

Nominal Power:	1500 Kw.
Rotor Diameter:	64 m
Type of rotor:	3 Blades, upwind
Power regulation:	Picth Control
Drive Train:	Gear Box, Slipping coupling and Generator
Gear Box:	Planetary, trhee steps
Generator:	Asynchronic, 6 polos
Type de tower:	Tubular in steel
Tower High:	70 m
Class II Running	Octubre 2005
Certificated :	DEWI OCC (GermanyAlemania)
Class:	IEC II y IEC Ia+ Patagonia hihg wind speed
Made:	German Technology, Patagonia manufacture.



Hdfk#sdw#z dv#yhulihg#dgg#hfdofxowhg#z wk#  
 wkh#Q hz #Ordgv



# Whw#Jhsruw

► DEWI Test

- Gear Box Tests,  
Generador Test and Blades Test (Germany 2007)



Blades Test Certification with DEWI For IEC Class “S”

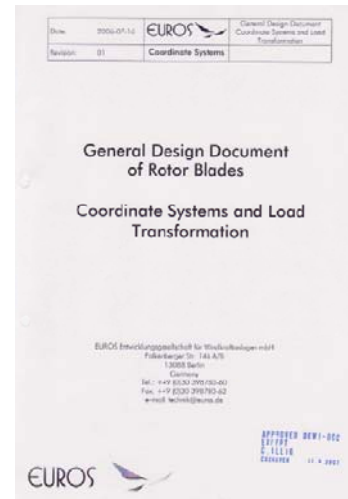
Generator  
VEM  
Certification  
Test with  
DEWI For  
IEC Class “S”



Gear Box,  
Certification  
Test with  
DEWI For  
IEC Class“S”



# T xddw| #F huwifdwtrq#Sur fhv#z Wk|G HZ IQR F F



- ▶ Loads calculation Certification for Class "S" (IEC Ia+) (Patagónian High Wind speed).-

- ▶ Power Quality Messurements Test report For the existing Class II Turbine

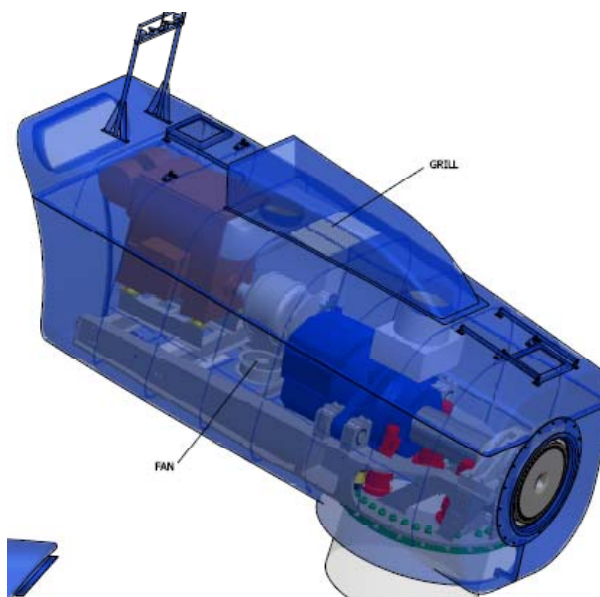
- ▶ General Design Certification for Rotor Blades for: Class "S" (IEC Ia+) (Patagónian High Wind speed).-

- ▶ Workshop Quality process



# Whfkgqrøj | #Wudqvihu

- ▶ Technology transfer right of main parts



# R x u # W h f k q r a r j | # x s s c h u w #

- ▶ Idaswind (DE)
- ▶ Euros Blade Manufacturer (DE)
- ▶ MITA TEKNIK Control System (DM)
- ▶ DEWI-OCC Certification Center (DE)
- ▶ Jadewind (DE)
- ▶ Mecal (DCH)
- ▶ JAKE (DE)
- ▶ VEM (DE)
- ▶ Rollix (FR)
- ▶ FAG- Schaeffler (DE)
- ▶ Hyundai (KR)
- ▶ ACSA ( AR)

## Argentine Towers Fabrication



## Argentine Manufacture nacelle and Nose cone



Electrical panels fabrication



Blade Manufacture Rights



- ▶ Class "S" Purchased by Enarsa to include in Patagonia Wind parks
- ▶ We are working to install the equipment in others South American countries
- ▶ We are negotiating with mayor financial groups to sponsor the serial turbine production





- ▶ From our NRG, the **NRG Class II in 77meter** rotor diameter was born. It's blades and tower are being modified in Germany at this time
- ▶ And we are working to Develop **Concrete Towers** to replace the steel ones, to avoid the dependence of the steel plates

The concrete in Argentina is cheaper than steel and it is easy to obtain and to work with it

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wr#qwgxfh# |#frp sdq|

