

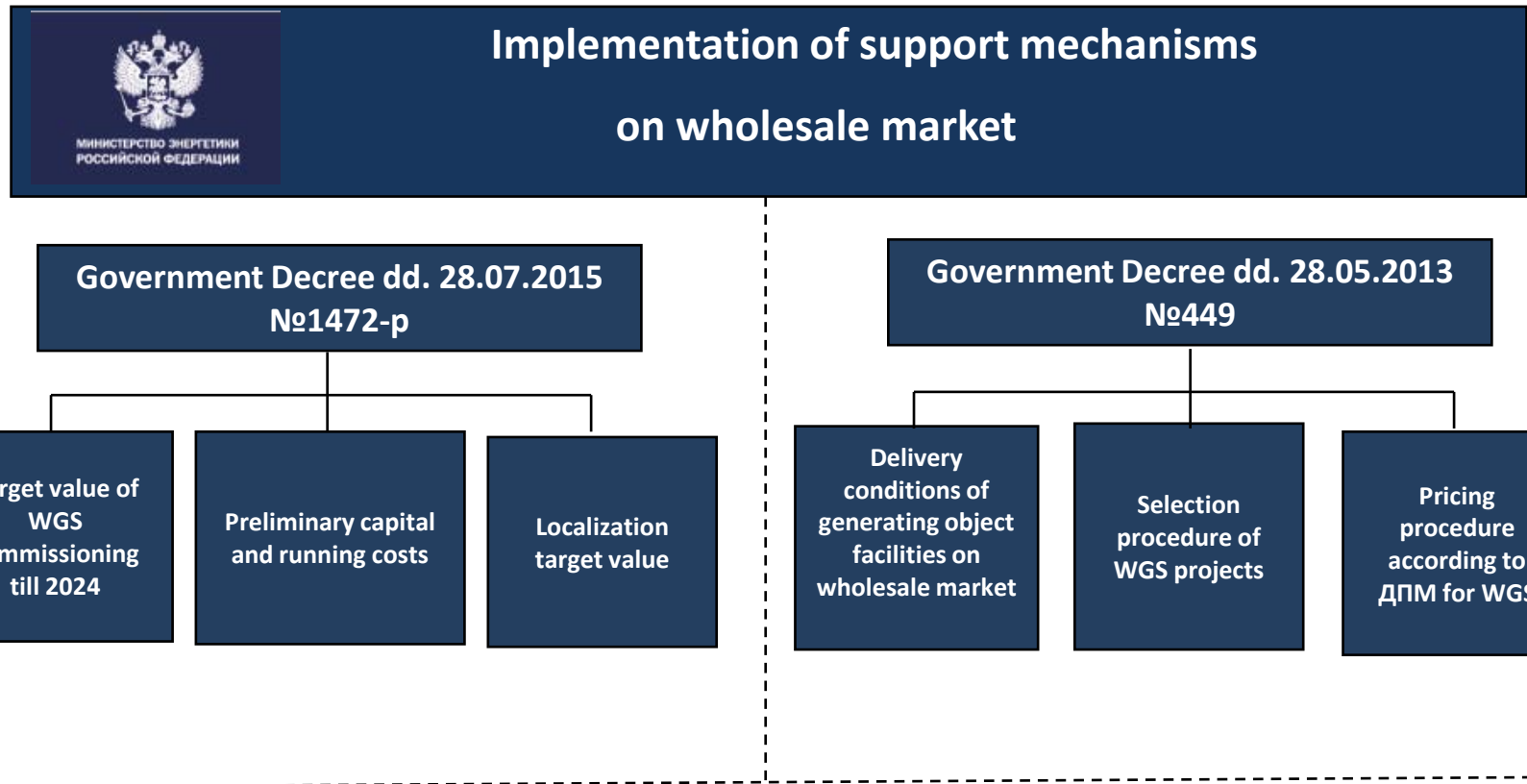
# PRODUCTION LOCALIZATION OF WIND TURBINES IN RUSSIA

AS PART OF GROUP «RUSSIAN WIND»

# Legal framework of Russia

- **RF Government Decree № 2084-p** dated November 11, 2013 – regulates the system of land–use planning in RF concerning power industry, including alternative energetic.
- **RF Government Decree №1472-p** dated July 28, 2015 – determines main state policy directions with reference to renewable energy recourses till 2024;  
estimates investment costs for generating objects construction based on renewable energy recourses.
- **Executive Order №449** dated May 28, 2013 – regulates stimulating mechanism of renewable energy recourses usage on wholesale market of electrical energy and facilities with ДПМ contracts.
- Market Council documents
  - Provision about recognition of a generating object, using renewable energy recourses, with the status of a qualified generating object (dated July 29, 2014, edited with amendments on October 30, 2014);
  - Regulation on the procedure of register issue & cancellation, which confirms production volumes of electrical energy using renewable energy recourses at qualified generating objects (dd. September 19, 2014);
  - Listing of qualified generating objects, which operate using renewable energy recourses, indicating placement of objects and company details owning mentioned here object;
  - Register of issuing and cancelling certificates of WGS.

# Russian Ministry of Energy. Position scheme



## **Main goal of WGS usage support on wholesale market:**

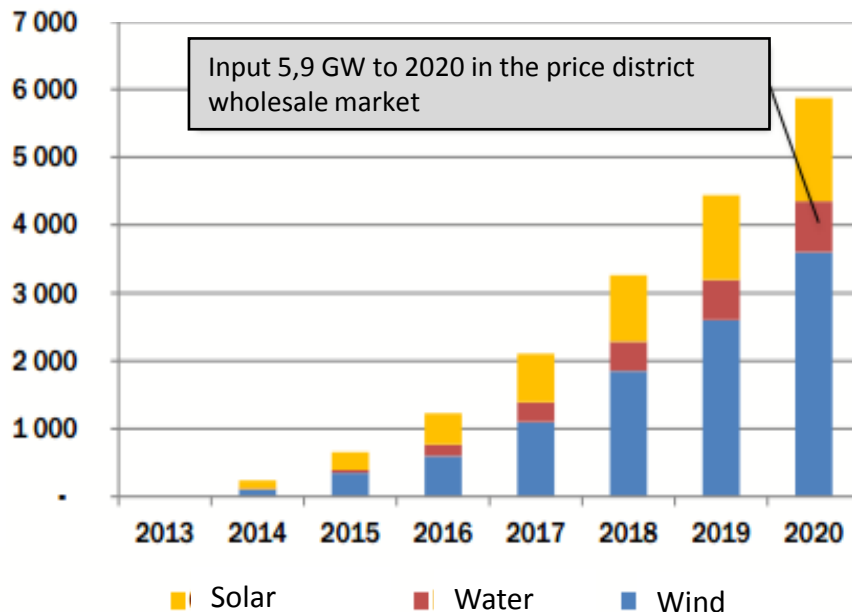
Create economy motivation in RF for production development of primary and (or) auxiliary generating equipment, using for electrical energy production on the base of renewable energy recourses.

# Difficulties of power industry in Russia

- **The industry needs to be totally modernized** – create conditions for hybrid generation, decommissioning of aged TPP, automation of power balance distribution. New facility generation is more moderate than old & deteriorated one.
- **The industry shall be taken to the new technological level** – modern generation technologies (wind power, small hydropower, solar power, biogas power, etc.); NPP efficiency increase of current generation (coal – 46%; gas – 60%).
- **Necessity to increase energy safety level in the state & regions** – decrease of generation prime cost through commissioning of cheaper recourses, stability increase amid cooperation of different generation technologies.
- **Increase of economic effectiveness of power system** – optimization of оптимизация large generating & net objects combination and small & medium distributed resources, close to consumers.
- **Need to implement the Smartgrid technology**– upgrading of emergency control, accomplish integration of European, Siberian & Far East energy systems.
- **Need to decrease negative influence of power industry on environment** – reduce threat for humans and wild-life, in particular in highly man-induced regions.
- **Need to create stable base for industry development** – raise of competitive ability of national industry by means of initial cost reduction of generating energy; provide sufficient facilities in developing regions.

# State support

Set capacity RER in frame of capacity trade mechanism on wholesale market



## Key parameters of the mechanism:

- ✓ Annual Ежегодный competitive selection of RER from 2013 – 4 years in advance – with 2 step auction
- ✓ Project sampling regarding lowest total capital costs
- ✓ Values of critical capital and running costs during competitions take into consideration operational experience in abroad, as well as peculiarities of an expense structure at project fulfillment in target-oriented regions of RF and approved by noncommercial organization «Soviet Ryinka»
- ✓ Requirements for localization fulfillment from 45% till 70% by 2016.
- ✓ Commissioning volumes correspond to equipment localization potential.

➤ In result of annual competitive selection of investment projects RER for the period till 2020, supposed maximum investment volume will be 466,159 mrd. RUR.

➤ According to noncommercial organization «Soviet Ryinka» and The Ministry of Economy Development of RF calculations additional preliminary electrical energy price rise for final customer by means of RER development in pricing zone on wholesale market in 2020 will sum up no more than 2% at total additional coat loading for a customer no more than 70 mrd. RUR in 2020.

➤ Thereby The Government can take control rise of annual total loading for consumers: according to results of first annual selections The Government of the Russian Federation can take a decision to reduce values of preliminary capital costs, as well as reduce the volume of commissioning facilities for RER.

# Development plan.



1. The Decree of the Russian Federation Government d/d 11<sup>th</sup> of November 2013 N 2084-p – determination of wind parks' sites, capacity & terms of their commissioning.
2. The Decree 1472-p «Mechanism for stimulation to apply renewable energy resources on wholesale market of electricity and power» d/d 28th of July 2015 - by 2024 introduction of 3,6 GW or 390 mrd. RUR at max. compensation volume of 110 mln RUR/MW. **The demand for localization level – 65% by 2019.**
3. The Decree of the RF Government d/d 28.05.2013 N 449 “Mechanism for stimulation to apply renewable energy resources on wholesale market of electricity and power”.

# About our company.



Arrangement of blade, towers & turbine production according to foreign company license. On the first stage we work with the following companies:

- German company WINDnovation – owner of blade production technology.
- Company Russian Krylia – project company of affiliated fond RUSNANO, Ulnanotech, owner of blade production process.
- Affiliated company – production site for blade manufacturing
- Company-partner – transformers production.

**Along with equipment supply we provide full range of services, in particular delivery, mounting, commissioning operations and start-up of installations. We are open for co-investment and financial partnership.**

**For provision of high technical availability we recommend service maintenance for wind turbines for the whole period of operation (up to 15 years).**

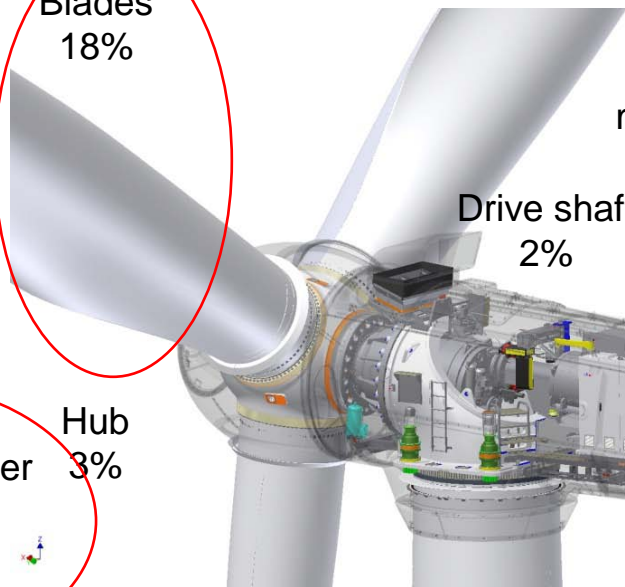


# Localization in 2017.

Searched sites,  
wind monitoring, electrical  
and construction works  
21%



Blades  
18%



Body frame and  
mounting of fittings 5%

Tower  
13%

Drive shaft  
2%

Cooling system  
2%



Hub  
3%

Генератор  
5%

Transformer  
4%

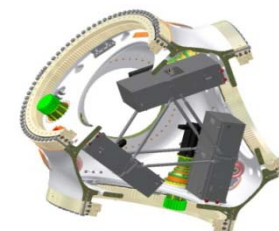


Inverter  
8%

Controlling system for turning  
angle by a blade with a drive  
3%

Controlling system for  
turning angle by a nacelle 6%

Gear  
10%





# Blades – 18%.

Blade production is based on workshops of JSC «Khimprom», Novocheboksarsk.

1. Site area: 13 890 sq.m.
2. Location near to cargo port in Novocheboksarsk
3. Access auto- & railway routes.
4. Sites allow to install production lines for 2 moulds having a capacity of 300 blades/ year (up to 300 MW).
5. Possible output expansion to 4 mould (up to 600 blades or 600MW/year) by means of joining of empty workshops.



# Blades, partner.



**WINDnovation** – our strategic partner in blade production  
Main function of the company – technology transfer  
for rotor blade production facilities on local markets.



**LZ Blades** – leader on Asian market in blade manufacturing.

Partnership in equipment delivery for blade production (molds), personnel training and process control on initial stage of facility arrangement & production release.



# Tower – 13%.

Tower manufacturing is based on active manufacturing facility.

1. Site area – 80 000 sq.m.
2. The company is fully completed with equipment designed for 100 m tower production.
3. Location near to cargo port in Novocheboksarsk.
4. Access auto- & railway routes.
5. 1<sup>st</sup> stage – assimilation of tower production with volume of 50 items/year.
6. 2<sup>nd</sup> stage– output expansion up to 100 items/year that can be compared with supply of generators with towers with total power up to 300 MW.



# Towers, production.



# Towers, production.





# Transformers – 4%.

Transformers production based on operating specialized companies.

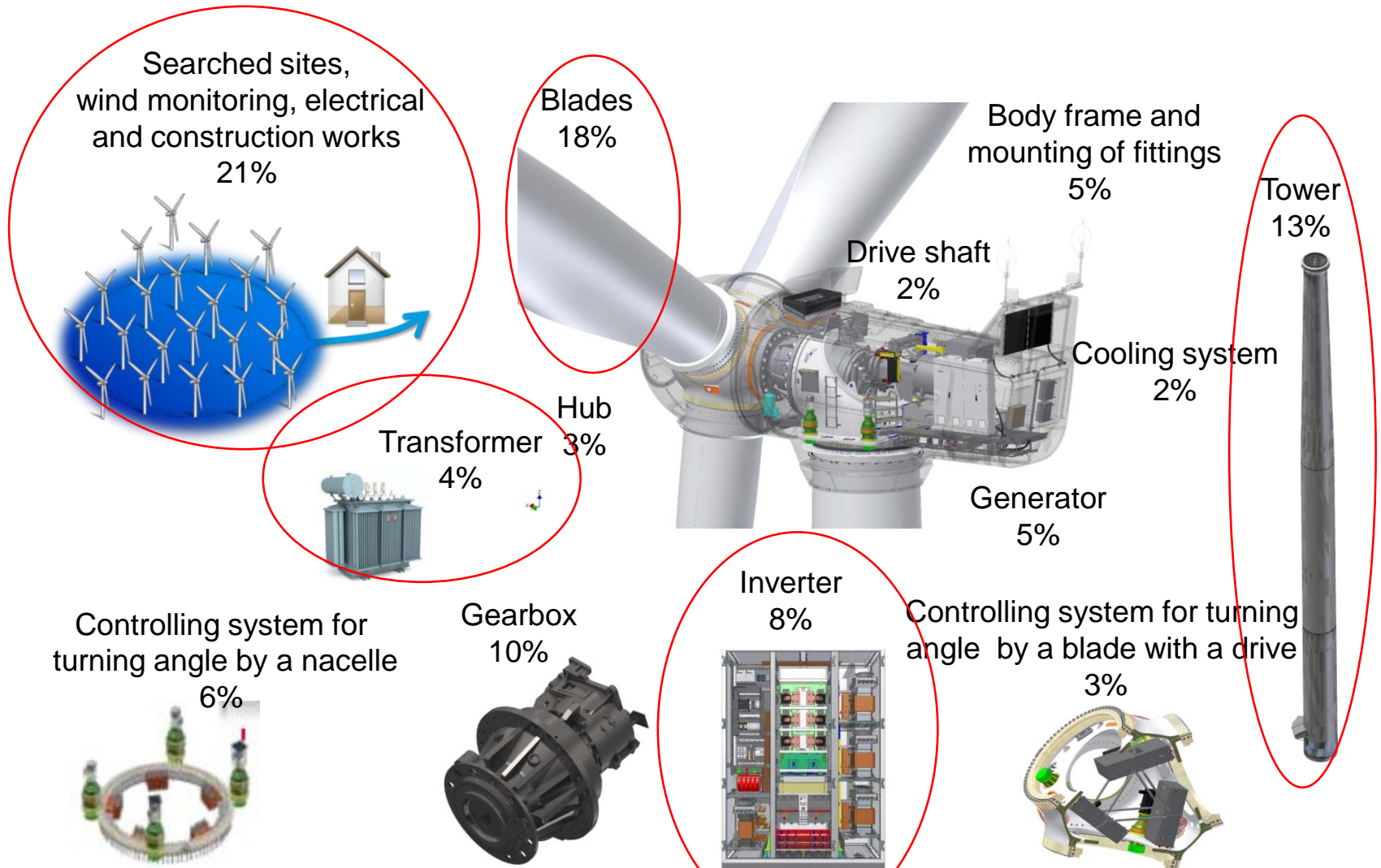
1. There 44 companies among potential producers of dry transformers.
2. Two companies confirmed their consent to produce transformers of needed quantity, besides they performed necessary calculations initial project preparations.





# Localization in 2018

In 2016 it is planned to fulfill production set setup of inverters (8%) to provide wind power systems with up to 300MW/year totally.



# Auxiliary services.

1. Supply of wind measurement equipment. Met masts of 100 m in height of local production, certified systems of wind, temperature, moisture & pressure measurement.
2. Wind monitoring with issue of certified report.
3. Equipment delivery to construction site.
4. Equipment installation at construction site.
5. Warranty & maintenance services of supplying equipment up to 15 years.



# Contacts



Evgeniy Nikolaev

Director of Russian Wind Ltd

Tel: +7 (495) 225 93 90.

Fax: +7 (495) 225 93 00

Mob: +7 (927) 668 05 06

E-mail: [e.nikolaev@russianwind.su](mailto:e.nikolaev@russianwind.su)

WWW: [russianwind.su](http://russianwind.su)