



Legislative support for wind power in the Russian Federation

and

the market status

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Russian Association of Wind Power Industry (RAWI)

Russian Association of Wind Power Industry "(RAWI), is independent, nonprofit organization that works in the interests of the State and members of RAWI It represents Russian wind power in international professional associations - EWEA and GWEC.



RAWI has the most up to date information on developments in the market, the planned wind turbine manufacturing projects, the construction of wind farms. It provides practical assistance and support to the companies - members of the Association in the development of their business and reduce risks due synergy effect and high competence in the market.

RAWI members are more than 70 companies – global OEM leaders : GE, Vestas, Gamesa, Siemens, biggest Russian power industrial companies: Power Mashines, Rotec, etc., design companies, construction companies, research institutes, diplomatic organizations.

RES support legislation principles

Legislation principles:

- 1 Defined plan for capacity by 2024 and degree of localization of equipment
- 2 Defined the procedure of stimulation of development of renewable energy projects through LTCA
- 3 Defined the procedure of return of investments and the profitability of wind farm investment projects
- 4 Rising level of the degree of local content of production of wind turbines
- 5 Fixed for every tender CAPEX level as the part of formula of calculation income. Formula is connected with currency quotation level

Approved local content	2016	2017	2018	2019 - 2024
Wind farm*	25%	40%	55%	65%

*Design and construction works are also taken into account and total equal to 21%. For example at 2019: 65% = 21% of works + 44% wind generator

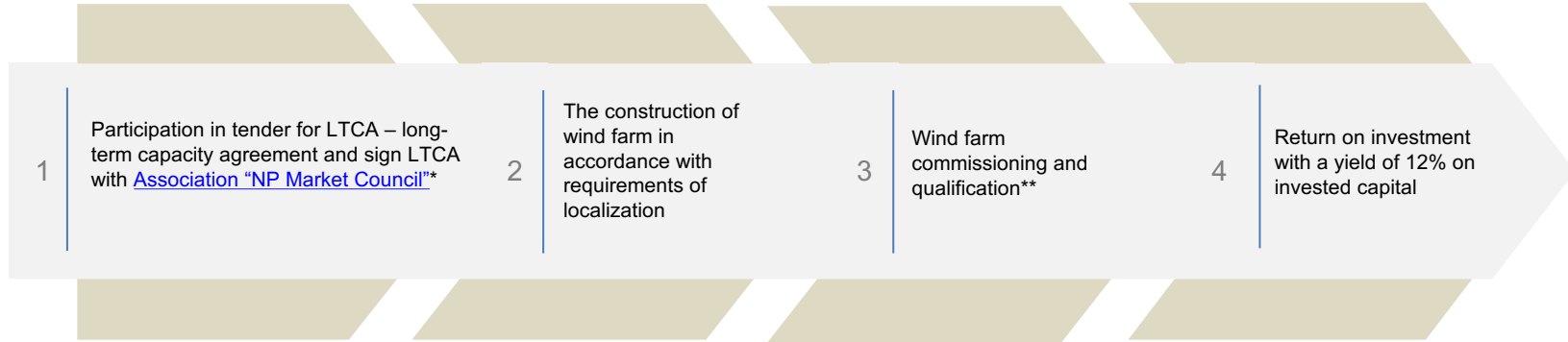
Approved CAPEX	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
CAPEX, RUR / kW	110 000	109 890	109 780	109 670	109 561	109 451	109 342	109 232	109 123	109 014

The plan of capacity commissioning ("quotas" for tender for LTCA long term capacity agreement)

Period	MW	Actual in April 2017
2015	51	
2016	50	
2017	200	35 MW – Fortum JSC 51 MW – Altran LLC
2018	400	150 MW – Rosatom Group
2019	500	200 MW – Rosatom Group
2020	500	260 MW – Rosatom Group
2021	500	
2022	500	
2023	500	
2024	399	
Total	3 600	

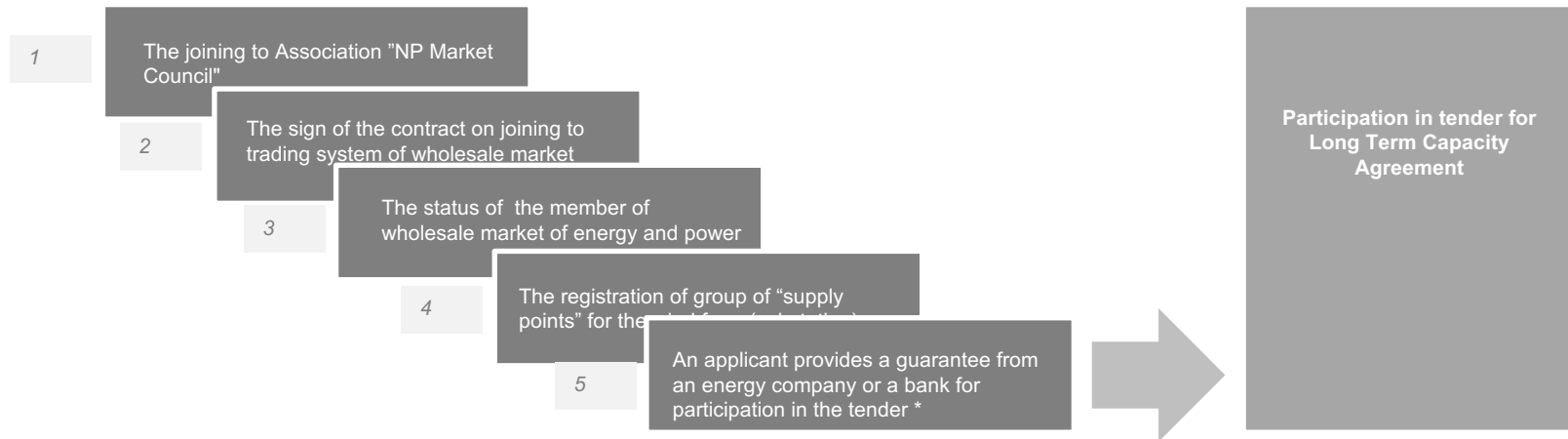
- LTCA the tender is held every year. The tender criterion is the CAPEX.
- Each tender is held "for 4 years ahead".
- A participant with lowest CAPEX wins the tender
- "Quotas" is not contested in the tender, go to the next tender
- Winner gets 15 years LTCA contract with guaranteed 12% annual profit.

The order of development of a wind farm and participation at the tender for LTCA.



*Regulator of wholesale and retail energy and capacity markets, authorized by the state to oversee the implementation of legislation in the field of energy

** Qualification is carried out by the Association "NP Market Council" in conjunction with the Ministry of Industry and Trade



*Guarantee from energy company that owns at least 2,500 MW of generating capacity, or a major bank. Guarantee that the pretender will build a wind farm in a certain year. If he does not build, the guarantor is fined 5% of the sum of the capex.

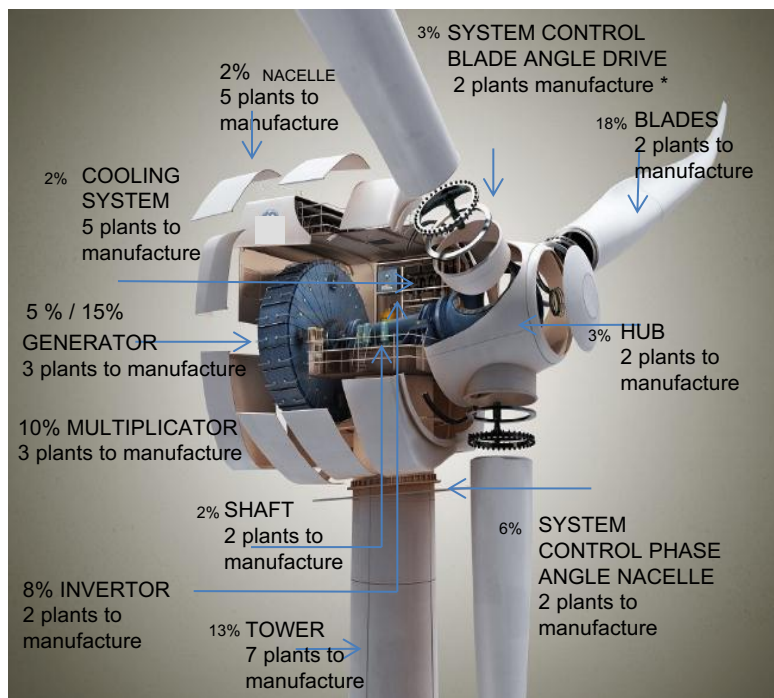
Wind farm qualification and local content manufacturing status

After construction and commissioning of each wind park must pass the qualification procedure by Association Market Council".

Criteria for the recognition of the wind park qualified:*

- 1 Wind park operates solely on the basis of renewable energy sources
- 2 Wind park is commissioned
- 3 Wind park is connected to the electric grids and equipped with measuring equipment
- 4 Wind park is listed in the local plan or program of perspective development of electric power
- 5 Wind park corresponds to the required level of local content corresponding to the year of commissioning

Local content is not a problem at all



Big parts of wind turbine has predefined by legislation percentage

During the construction of wind farms required equipment localization. From 2016-25%; 2017- 40%; 2018 - 55%; 2019 and further 65 % of all works, services and equipment components must be made on the territory of the Russian Federation.

In the case of non-fulfillment of requirements LTCA payment decrease at 0.45

*Manufacturers for each component existed in Russian Industry during 2014-2017

Register of wind farms in the Russian Federation for 2017.

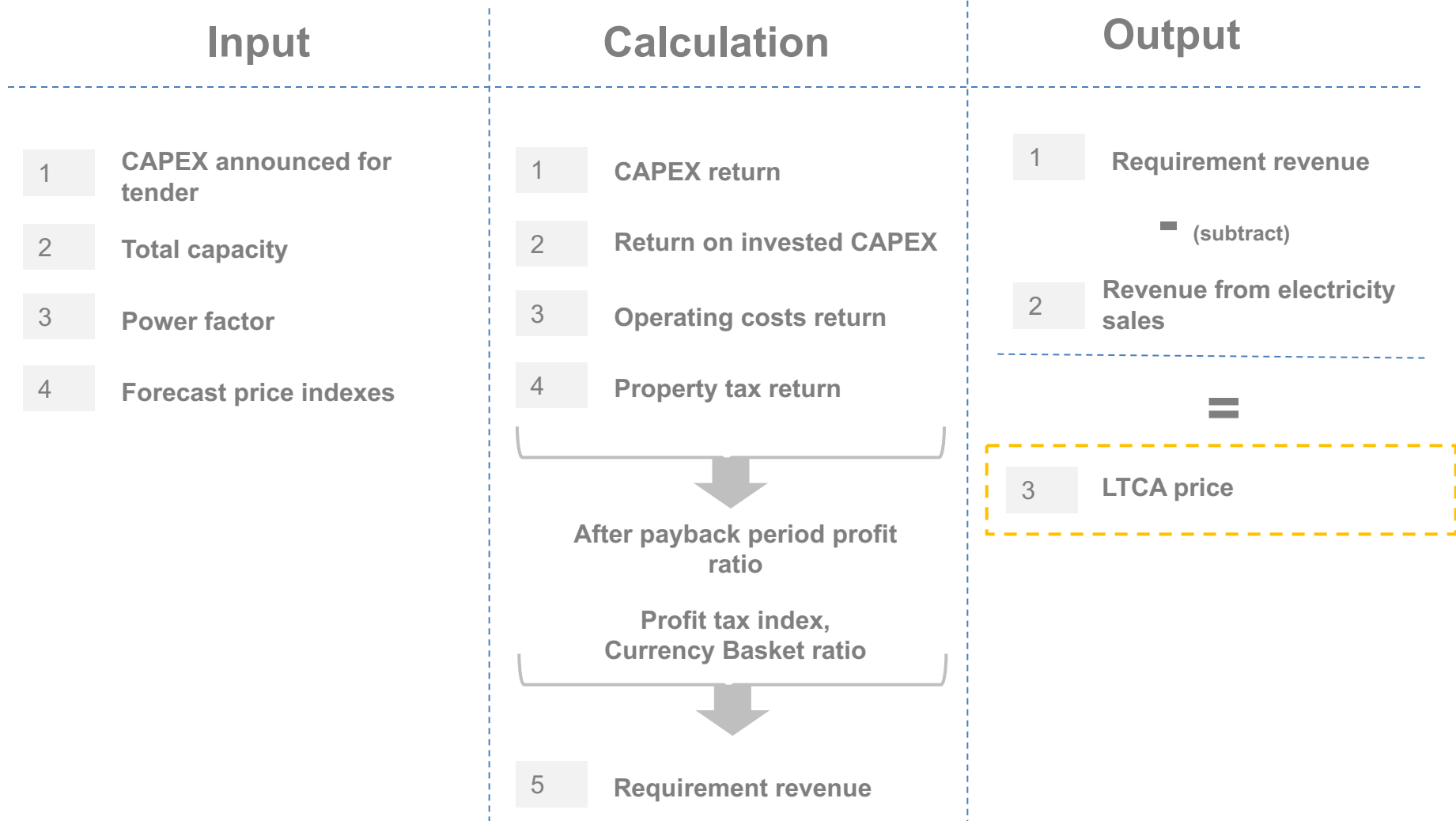
The development of wind parks in Russia started in 2008. Currently, several companies at various stages have prepared wind farm projects for more than 2500 MW. All of them are marked on the map of the Wind Park Register, prepared by the RAWI and keeping up to date. The map shows all the necessary information about the project, contact information about its owner, the current status of the project. The full version of the map is available to the members of the association.



Companies , signed LTCA till April 2017:

- 51 MW - Falcon Capital LLC LLC - in 2017, a contract was announced for the supply of FWT turbines
- 35 MW - JSC Fortum, Ulyanovsk region. It is being built, the launch in 2017.
- 610 MW - JSC "OTEC" SC Rosatom - start-up from 2018-2020, turbines Lagerwey

Long Term Capacity Agreement price calculations (simplified)



LTCA calculations (15 years period) – example (simplified)

Input

- 1 **110 000 000 RUR per MW**
CAPEX announced for a tender
- 2 **100 MW**
Total capacity
- 3 **35%**
Power factor
- 4 1. Consumer price index forecast
2. Electricity price forecast
3. The yield of state obligations forecast

Calculation

- 1 **11 000 000 000 RUR**
CAPEX return
- 2 **10 560 000 000 RUR**
Return on invested CAPEX
- 3 **3 700 000 000 RUR**
Operating costs return
- 4 **1 470 000 000 RUR**
Property tax return

0,9

After payback period profit ratio

1,25

Profit tax index

- 5 **26 400 000 000 RUR**
Requirement revenue

Output

- 1 **26 400 000 000 RUR**
Requirement revenue

■ (subtract)

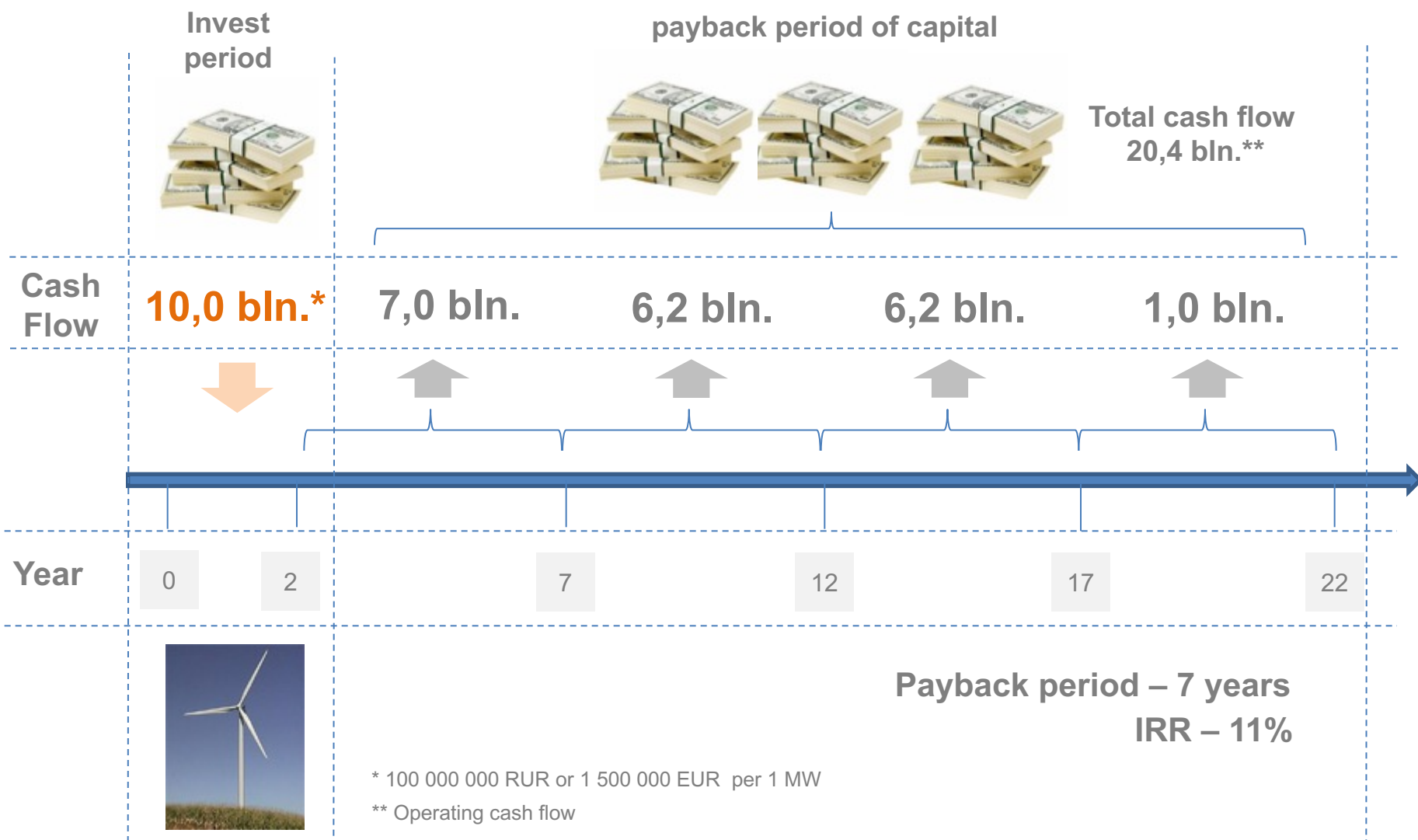
- 2 **6 000 000 000 RUR**
Revenue from electricity sales

=

- 3 **20 400 000 000 RUR**
LTCA price

The average annual LTCA price
- **1 360 000 000 RUR**

Investment performance of WP project (simplified)



THANK YOU FOR ATTENTION!

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