



OUTLOOK OF RENEWABLE ENERGY OF THE RUSSIAN FEDERATION



5th September, 2008

ISEDC has a status of a **Category 2 Centre under the auspices of UNESCO**
The relevant agreement was signed between the Russian Government and UNESCO

ISEDC is guided and supervised by a Governing Board, which should ensure compliance of the Centre activities with the purposes for which it was established. Minister of Energy of the Russian Federation, Mr. Alexander Novak, is the Chairman of the ISEDC Governing Board since 16 January, 2013

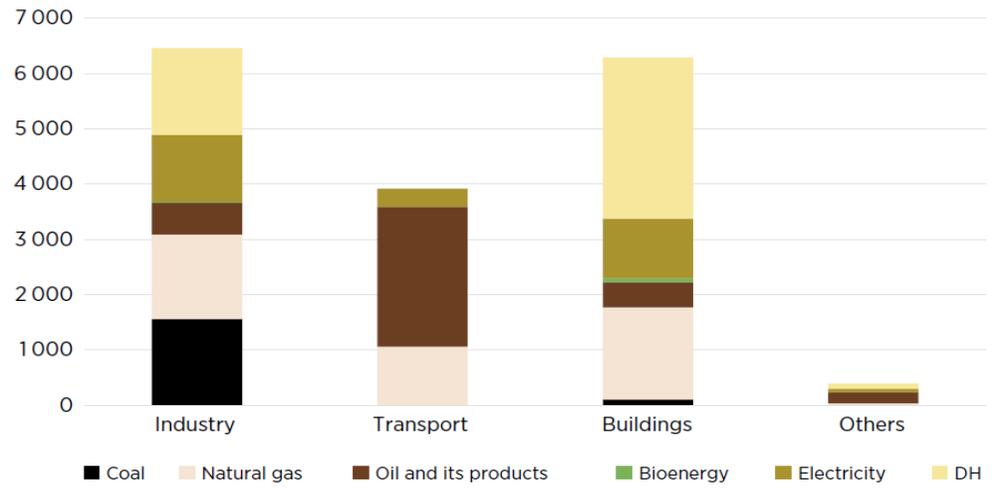
ISEDC mission is to promote humanitarian aspects and principles of sustainable energy development

ISEDC main function is to serve as an international platform for communication and collaboration between world's leading scientists and experts on present and future global energy challenges

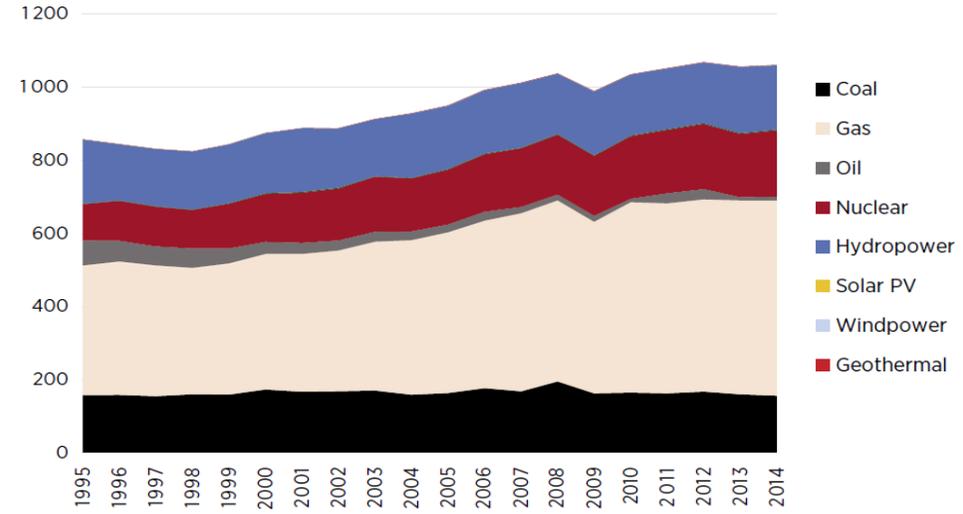
OVERVIEW OF ENERGY GENERATION AND CONSUMPTION IN RUSSIA

INTERNATIONAL SUSTAINABLE ENERGY DEVELOPMENT CENTRE UNDER THE AUSPICES OF UNESCO (ISEDC)

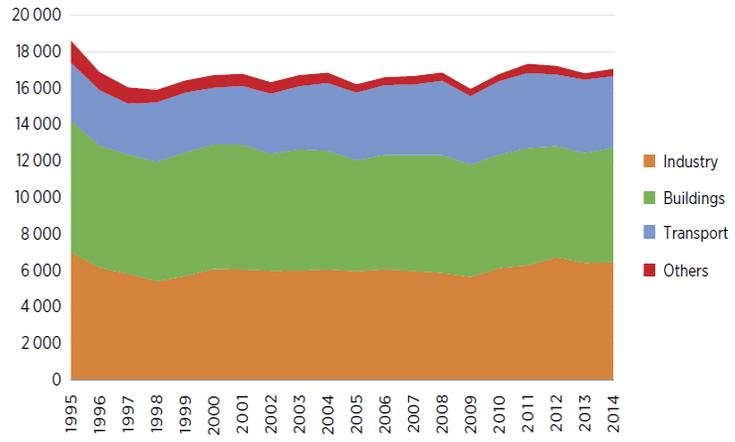
Total final energy consumption in 2014 (PJ)



Total electricity generation (TWh/yr)



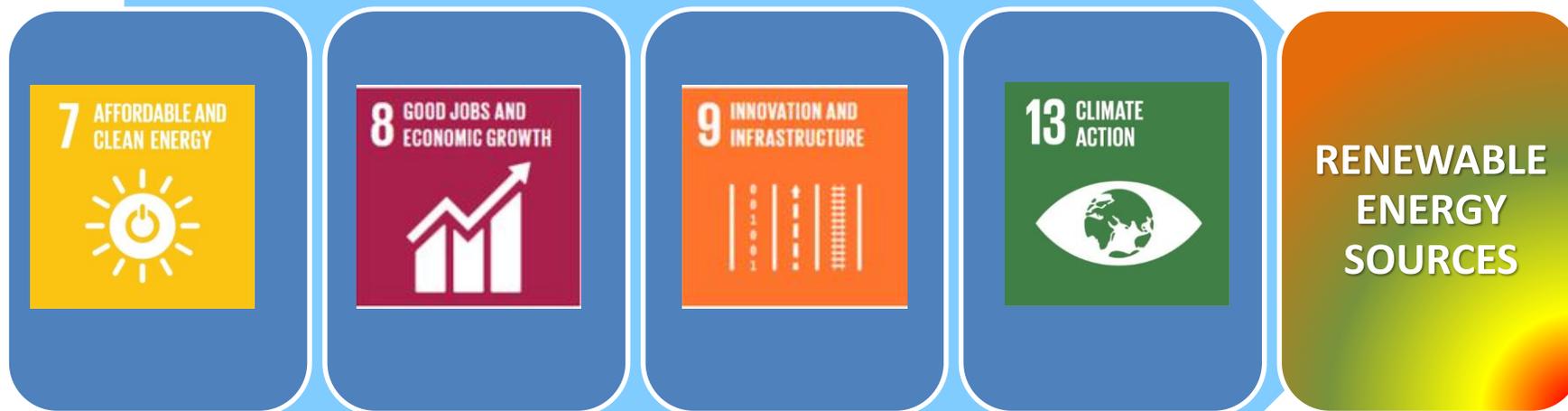
Total final energy consumption (PJ/yr)



MAIN DRIVERS OF THE RENEWABLE ENERGY SOURCES DEVELOPMENT IN RUSSIA

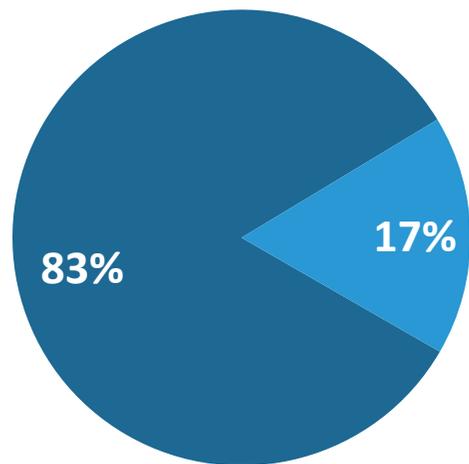
INTERNATIONAL SUSTAINABLE ENERGY DEVELOPMENT CENTRE UNDER THE AUSPICES OF UNESCO (ISEDC)

! Full compliance with at least
4 UN SUSTAINABLE DEVELOPMENT GOALS

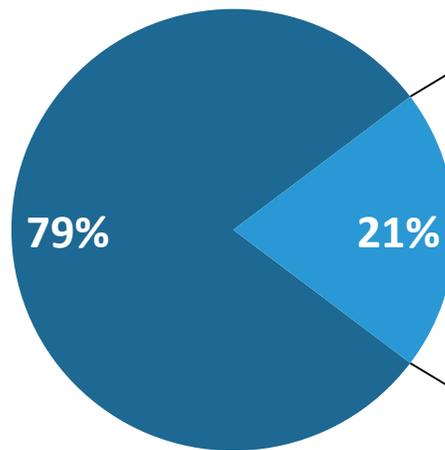


Energy mix of Russia

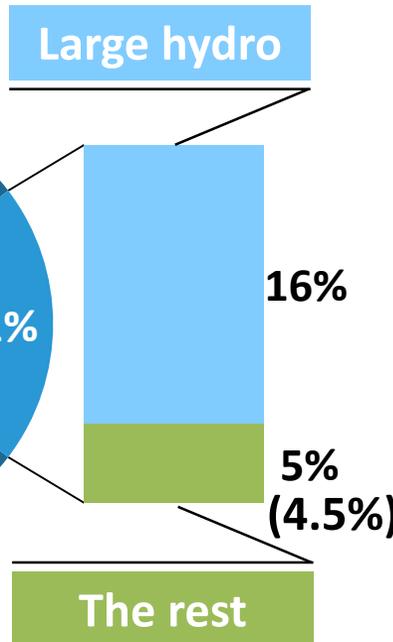
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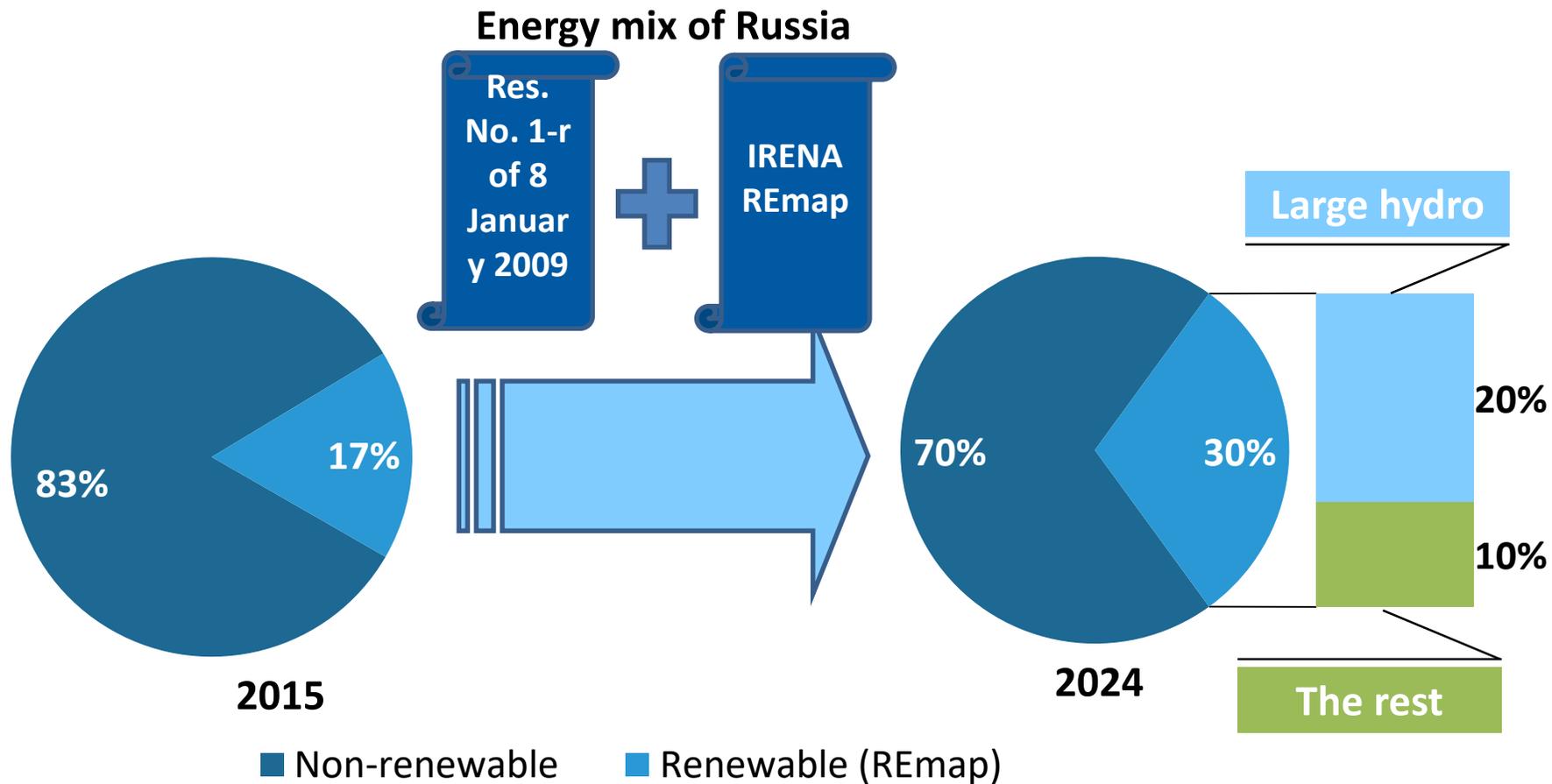
2015



2024



■ Non-renewable ■ Renewable (reference case)



	2010	Reference case 2030	REmap 2030
Gross electricity generation (TWh/year)			
Coal	166	161	161
Natural gas	521	663	568
Oil	9	12	12
Nuclear	170	224	186
Hydropower	166	206	278
Bioenergy	3	6	74
Solar PV	0	0	3
Onshore wind	0	10	31
Geothermal	1	1	10
Total	1036	1284	1322
District heat generation (PJ/year)			
Coal	1232	1045	889
Natural gas	4010	3778	3617
Oil	312	235	206
Nuclear	15	48	48
Bioenergy	120	155	501
Total	5688	5261	5261

	2010	Reference case 2030	REmap 2030
Electricity capacity (GW)			
Coal	49	36	36
Natural gas	105	138	120
Oil	6	5	5
Nuclear	24	32	27
Hydropower	47	55	74
Bioenergy	0	2	26
Solar PV	0	3	5
Onshore wind	0	5	14
Geothermal	0	0	1
Total	231	276	308

Federal Law 35-FZ “On electric energy”

Support mechanisms for renewable energy

Wholesale market

Sale of electric power under power supply contracts of qualified RES-based generation facilities

Retail market

The obligation of grid companies to buy electricity of RES-based generating facilities at regulated tariffs for losses compensation

Costs compensation of technological connection to electric networks for qualified RES-based generation facilities from the federal budget

A number of **regional initiatives** have also already been proposed which aim to stimulate the **development, production and use of renewable energy sources**

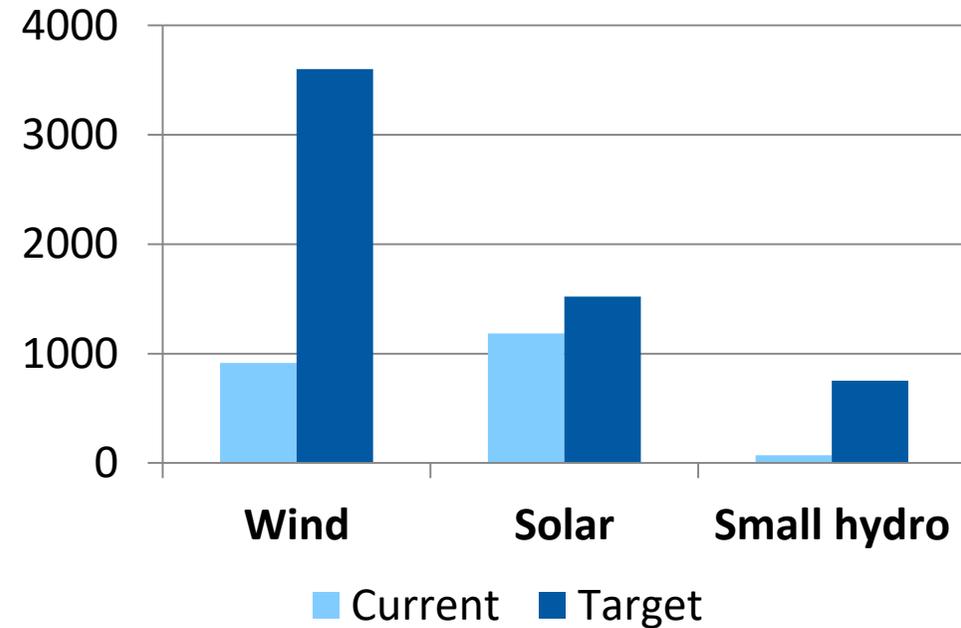


RESULTS OF RENEWABLE ENERGY AUCTIONS IN 2014-2016 (MW)

INTERNATIONAL SUSTAINABLE ENERGY DEVELOPMENT CENTRE UNDER THE AUSPICES OF UNESCO (ISED/C)

	2014	2015	2016	2017	2018	2019	2020
Power capacities to be provided by the projects approved (MW)							
Wind	0	66	50	90	150	200	360
Solar PV	35	140	199	255	285	270	-
Small hydro	0	0	0	21	0	50	-
National target values (MW)							
Wind	-	51	50	200	400	500	500
Solar PV	35.2	140	199	150	270	270	270
Small hydro	-	-	-	124	141	159	159
Total	35.2	191	249	574	811	929	929

Source: ATS Energo, 2016



Decree of the Russian Government of 23 January 2015 # 47 established measures to support RES on retail electricity market

In accordance with the approved measures:

- Grid operators should buy electricity from RES objects, but **not more than 5%** from volume of network electricity losses
- RES investors should comply with **localization requirements that are the same as for the wholesale electricity market**



Berdin V.Kh., Kokorin A.O., Yulkin G.M., Yulkin M.A.

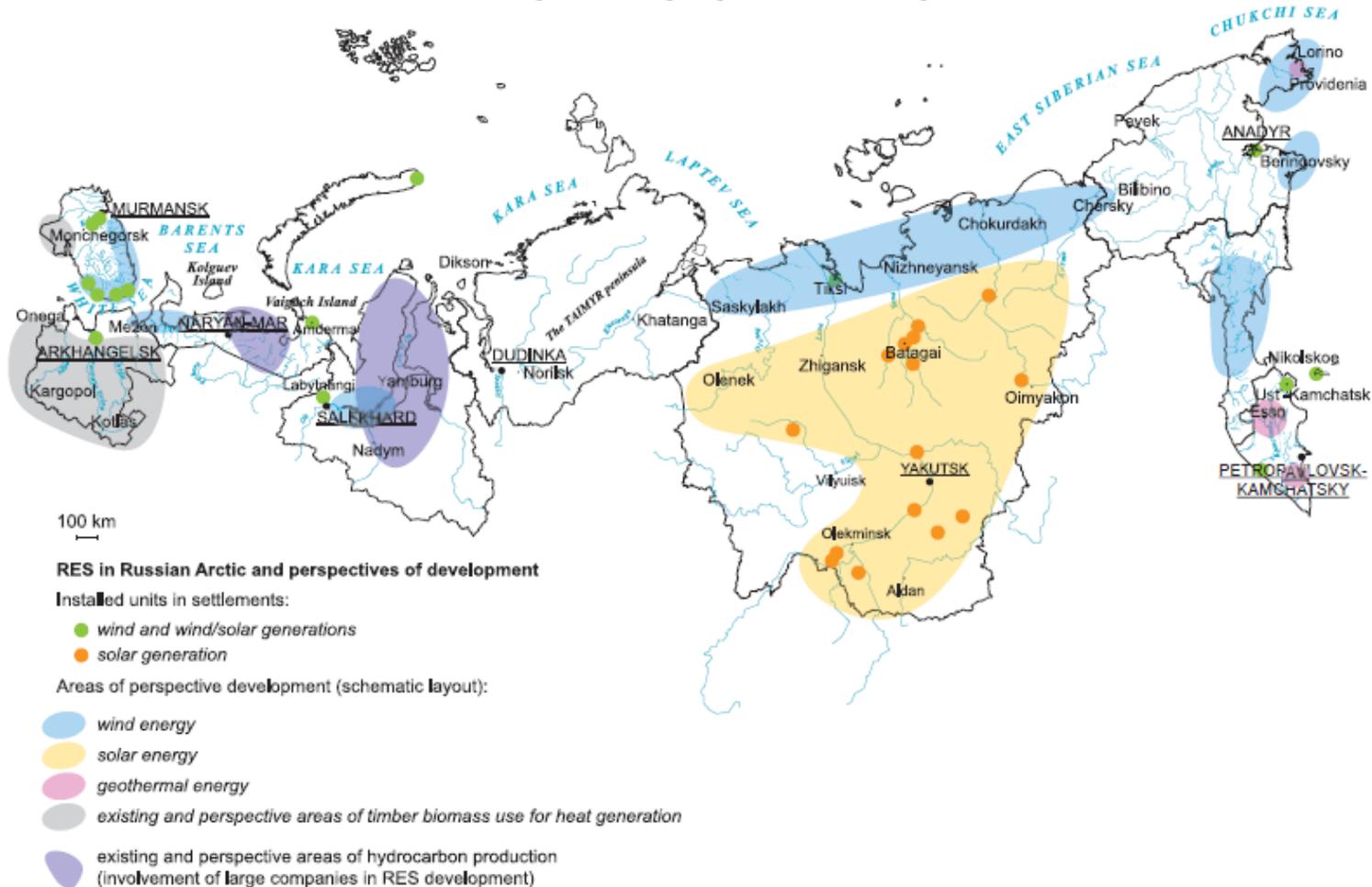
RENEWABLE ENERGY IN OFF-GRID SETTLEMENTS IN THE RUSSIAN ARCTIC



Moscow • 2017

INTERNATIONAL SUSTAINABLE ENERGY DEVELOPMENT CENTRE UNDER THE AUSPICES OF UNESCO (ISED/C)

Russian Arctic: the main wind and solar plants and perspectives of development



Berdin, V.Kh., Kokorin, A.O., Yulkin, G.M., Yulkin – WWF, Moscow. 2017

THREATS AND OPPORTUNITIES OF REMAP IN RUSSIA

GLOBAL ENERGY DEVELOPMENT CENTRE UNDER THE AUSPICES OF UNESCO (ISED)

THREATS

- high cost of capital
- cost of renewable energy projects
- long-term energy business practices based on a conventional approach
- high availability of energy and low availability on the fuel production end

OPPORTUNITIES

- grid modernization
- enhancement flexibility of the system
- higher involvement of decentralized systems
- stable investment
- lower greenhouse gas emissions

WEAKNESSES

- current excess of installed capacity
- complex dispatchability of the RES
- insufficient density of electricity transmission grids
- lack of law

STRENGTHS

- governmental concern and support
- ambitious plans and firm position of renewable market players
- increasing interest of traditional energy companies
- public concern

THANK YOU FOR YOUR ATTENTION



Sustainable
Energy
Development



International centre
under the auspices of UNESCO

Autonomous Non-Commercial Organization
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