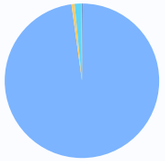
Russia • Renewable energy • Hydro, Geothermal, Tidal, Bioenergy

Gross electricity generation from renewable sources by 2021, GWh (%):



- Bioenergy 393.00 (0.2)
- Hydropower 213 098.86 (97.6)*
- Solar PV energy 1 453.31 (0.7)
- Wind energy 2 897.42 (1.3)
- Geothermal energy 421.43 (0.2)
- Marine energy 0.35 (0.0)

Total: 220 264.37 (100)

Source: Renewable Energy Statistics 2023 © IRENA
** excluding pumped storage*

In 2019, Russia had 255.1 GW of electricity installed generating capacity. Gross theoretical hydropower capability, related to Russia, is 2295.0 TWh/year. As of 2019, Russia registered about 112 small-scale hydropower plants up to 10 MW with a total installed capacity of 169.6 MW, about 29 small-scale hydropower plants between 10–30 MW a total installed capacity of 656.9 MW and about 141 hydropower plants up to 30 MW with a total installed capacity of 826.5 MW.

Sources: Ministry of Energy of Russian Federation Report (2021); World Small Hydropower Development Report 2019; Used by permission of the World Energy Council (2013).

Key wood pellet plants by production capacity, t/y:

1. Vyborg, Vyborgskaya Forest, 1 000 000
2. Vanino, Arkaim Forest, 240 000
3. Krasnoyarsk, DOK Yenisei, 120 000
4. Arkhangelsk, Lesozavod 25, 100 000
5. Torzhok (Taleon Terra Plant), STOD, 80 000
6. Veliky Ustyug, Vologdabioexport, 50 000
7. Krasnoyarsk, Novoyeniseysky LPH, 40 000
8. Impilahti, Stora Enso / Setles, 25 000
9. Nebolchi, Setnovo, 25 000
10. Tikhvin, Mir Granul, 20 000

Tidal power plants over 1 MW, MW:

1. Kislaya Guba, 1.7
2. M. Mezenskaya, 1.5

Single flash type geothermal power plants, MWe:

1. Mutnovskaya, 50.0
2. Pauzhetskaya, 14.5
3. Verkhne Mutnovskaya, 12.0
4. Mendeleev, 3.6
5. Ocean, 2.5

Major biomass power plants over 1 MWel, MWel:

1. Sharinskaya, 24.0
2. ZAO Belyi Ruchei
3. (White Creek), 5.0
4. Kirov, BioChemPlant, 5.0
   Syktyvkar, 4.3

Major bioethanol plants:

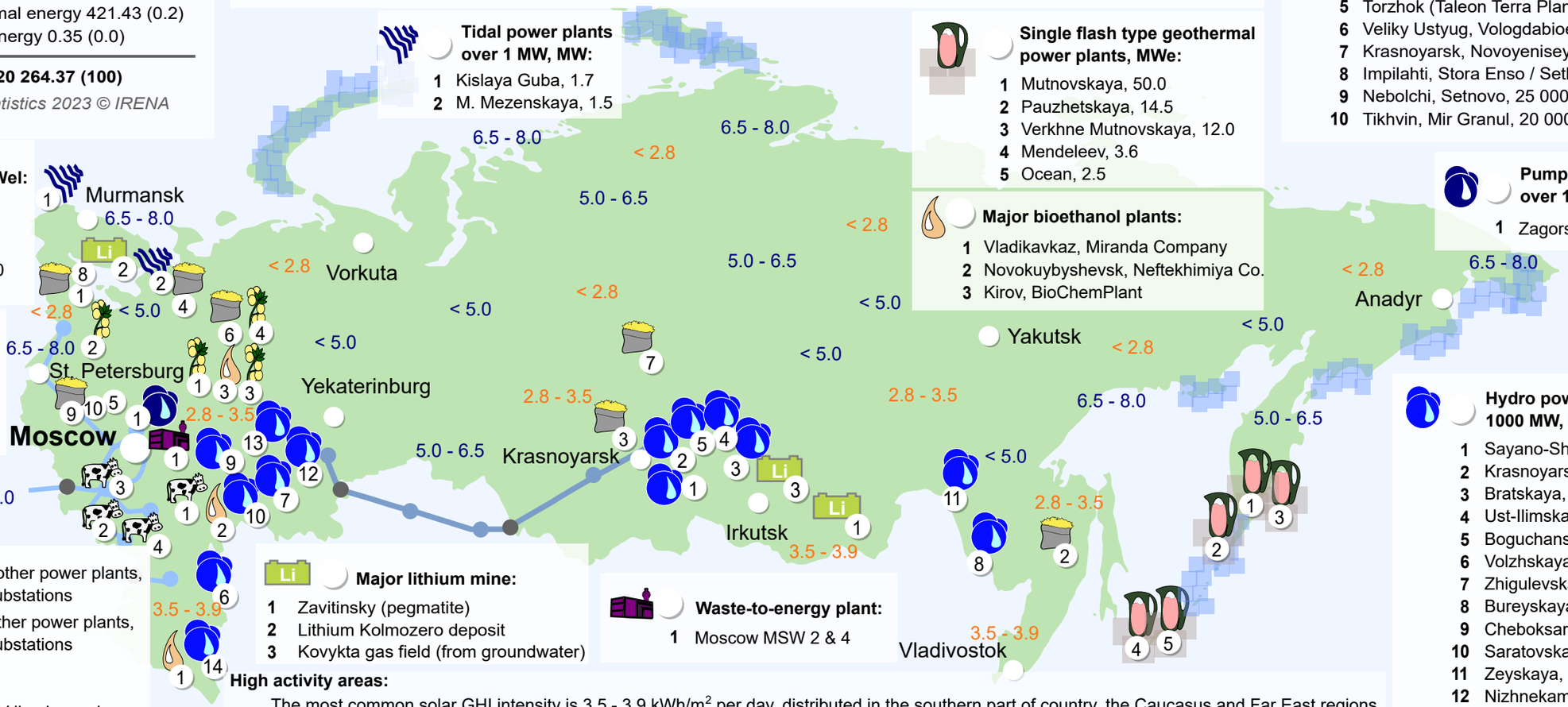
1. Vladikavkaz, Miranda Company
2. Novokuybyshevsk, Neftekhimiya Co.
3. Kirov, BioChemPlant

Pumped-storage plants over 1000 MW, MW:

1. Zagorskaya, 1200

Major biogas plants over 1 MWel, MWel:

1. Romodanovo, 4.4
2. Luchki, AltEnergo, 2.4
3. Doshino, 2.4
4. Baytsury, RCOBT, 1.0



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Hydro power plants over 1000 MW, MW:

1. Sayano-Shushenskaya, 6400
2. Krasnoyarskaya, 6000
3. Bratskaya, 4500
4. Ust-Ilimskaya, 3840
5. Boguchanskaya, 3000
6. Volzhskaya (Volga), 2608
7. Zhigulevskaya, 2362
8. Bureyskaya, 2010
9. Cheboksarskaya, 1404
10. Saratovskaya, 1369
11. Zeyskaya, 1330
12. Nizhnekamskaya, 1205
13. Votkinskaya, 1020
14. Chirkeiskaya, 1000

- National grid 1150 kV of other power plants, grid connection points, substations
- National grid 750 kV of other power plants, grid connection points, substations
- Border crossing
- 1150 kV line in service
- 750 kV line in service

Major lithium mine:

1. Zavitinsky (pegmatite)
2. Lithium Kolmozero deposit
3. Kovykta gas field (from groundwater)

Waste-to-energy plant:

1. Moscow MSW 2 & 4

High activity areas:

The most common solar GHI intensity is 3.5 - 3.9 kWh/m^2 per day, distributed in the southern part of country, the Caucasus and Far East regions. The most common wind speed is over 8.0 m/s per year at 50 m are distributed in the northern and northeastern parts of country, Novaya Zemlya and Severnaya Zemlya archipelagos, Kuril islands and the Chukotka AO coastline with the Bering Sea. *Sources: Energydata.info; Wikipedia*