Development of distributed power generation in the Russian Far East

Maksim Gubanov, Head of direction (Power & Utilities)
Electric power industry of the Russian Far East

Installed power: 17.5 GW
Peak load: 10.4 GW
Length of power lines 220-500 kV: 18.4 thous. km
Power of substations 220-500 kV: 17.3 thous. MVA
Electricity export: 4.5 billion kWh

Electricity consumption, million kWh (Far East):
- UES of East: 61,674
- Buryatia and Zabaykalsky Krai: 46,570
- Other isolated power systems: 752

Generation structure, MW (Far East):
- Thermal power plants: 17,545
- Hydroelectric power plants: 5,874
- Diesel power plants: 287
- Solar stations: 537
- Nuclear power plants (106 MW)
- Geothermal power plant (81 MW)
### Key operating indicators of UES of East

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2024</th>
<th>2027</th>
<th>2029</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed power, MW</td>
<td>11 341</td>
<td>12 810</td>
<td>13 031</td>
</tr>
<tr>
<td>HPP, MW</td>
<td>4 617</td>
<td>4 617</td>
<td>4 721</td>
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<tr>
<td>HPP, MW</td>
<td>6 724</td>
<td>8 193</td>
<td>8 309</td>
</tr>
<tr>
<td>Electricity consumption, million kWh</td>
<td>48 554</td>
<td>61 930</td>
<td>63 404</td>
</tr>
<tr>
<td>Maximum load, MW</td>
<td>8 391</td>
<td>9 821</td>
<td>9 870</td>
</tr>
<tr>
<td>Electricity export, million kWh</td>
<td>4 500</td>
<td>4 500</td>
<td>4 500</td>
</tr>
<tr>
<td>Excess (+) / deficit (-), million kWh</td>
<td>-3 457</td>
<td>-7 376</td>
<td>-3 715</td>
</tr>
</tbody>
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### Electricity consumption of UES of East

<table>
<thead>
<tr>
<th>Year</th>
<th>Electricity consumption, million kWh</th>
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<tbody>
<tr>
<td>2024</td>
<td>53054</td>
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<tr>
<td>2025</td>
<td>56374</td>
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<tr>
<td>2026</td>
<td>61942</td>
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<tr>
<td>2027</td>
<td>66430</td>
</tr>
<tr>
<td>2028</td>
<td>67528</td>
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<tr>
<td>2029</td>
<td>67904</td>
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</table>

### Industry development priorities

<table>
<thead>
<tr>
<th>Year</th>
<th>Increase in consumption 24-29: 28%</th>
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<tbody>
<tr>
<td>2024</td>
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<td>2025</td>
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<td>2026</td>
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<td>2028</td>
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<td>2029</td>
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</tbody>
</table>

### Key areas of industry development

#### Direction

- Modernization and construction of thermal generation
- Development of electric grid infrastructure
- Development of renewable energy
- Development of isolated power systems
- Development of distributed generation (local power grid)

#### Implementation mechanism

- Power supply agreement
- Electricity transmission tariff
- Electricity supply agreement
- Budget resources
- Energy service contract, concession agreement
Consumers and sources of local energy supply

Present

- Petroleum Industry
- Gas and oil power plants
- Diesel and fuel oil power plants
- Remote settlements
- Diesel power plants

Future

- Gas and oil power plants
- Small nuclear power plant
- Microgrid
Local energy of remote settlements

- 17 Federal subjects in Far East and Arctic
- 527 Remote settlements
- 800 MW Power plant
- 2300 MW Heating plant
- 300 thousand Population

Modernization of more than 80% of facilities is an investment-unattractive project
Local energy facilities are not included in electricity development programs
Insufficient government support for attracting private investment

>1 billion dollars investment potential

Ensuring guaranteed energy supply to consumers in remote regions
Modernization of inefficient diesel, coal and fuel oil generation
Reducing economically justified tariffs and cross-subsidies

60% average wear and tear of equipment
Local Power Generation Investment Projects

Region
Chukotka Autonomous Region
Anadyr city

Investor
Private investor
Resident of the ASEZ

Project
Renewable energy modernization under the concession agreement with the government of the Chukotka Autonomous Region

Parameters of capacity
Wind power plant 2,5 MW
Energy production 3 million kW/h per year

Impact
Gas savings - 320 thousand cubic meters or
Coal savings - 800 tons
Local Power Generation Investment Projects

Region
Republic of Sakha (Yakutia)
Verkhoyansky ulus
Ulakan-Kyuyol (Tabalakh)

Investor
Private investor
Resident of the AZRF

Project
Diesel power plant modernization based on renewable energy under energy service contract with RusHydro PJSC

Parameters of capacity
SPP 2,3 MW
DPP 5 MW
ESS 0,8 MWh

Impact
Fuel economy
1500 tons per year (up to 50%)
State planning

- Development of regional and municipal programs for local energy

State guarantees

- Concession agreement, public-private partnership, regulatory agreement

Business model

- Integrated energy contract, «take or pay»

Financial support

- Concessional financing, capital grant, tax incentives

Technology development

- State incentives for the production of innovative energy equipment
Fund for the development of local energy systems

Supervisory Board

- Private investors
- Scientific organizations
- Equipment manufacturers

Local energy fund

- Regulatory support and standardization
- Expertise and financing of projects
- Information and analytical support

Regional authorities

Resource supply organizations

Financial institutions
Proposal for cooperation with ESCAP members

Creation an international working group on island power systems at ESCAP

Cooperation in conducting international research and events

Development of local energy development programs and tools for their implementation