



uniting energy

**ENELT**

**STAND-ALONE HYBRID  
POWER SYSTEMS  
(SAHPS)**





# About us

ENELT Group is a Russian production company manufacturing uninterrupted and guaranteed power supply systems for energy, industrial, communications and transport facilities with engineering centers and representative offices in Russia and the CIS countries.

ENELT Group specializes in turnkey design and manufacturing of Stand-Alone Hybrid Power Systems (SAHPS) integrating renewable energy sources, diesel generators, and energy storage, all managed by our proprietary Automated Process Control System (APCS) that leverages machine learning and artificial intelligence.

The company is an active participant in diesel power generation upgrade projects in the Arctic region and the Far East of Russia. In 2024, at the St. Petersburg International Economic Forum, ENELT Group signed an agreement with KRDV, JSC to participate in a pilot project for the solar power plant construction in the Kamchatka Territory.

Together with RUSHYDRO, PJSC, ENELT Group is implementing energy service contracts for the upgrade of diesel power plants in 37 villages of Yakutia and Kamchatka.



# Stand-alone hybrid power system - SAHPS ENELT

SAHPS is an integrated solution for power generation, conversion, storage, and distribution, combining a diesel power plant, a solar and/or wind farm, and an energy storage system.

A diesel power plant (DPP) serves as the guaranteed and backbone source of electricity.

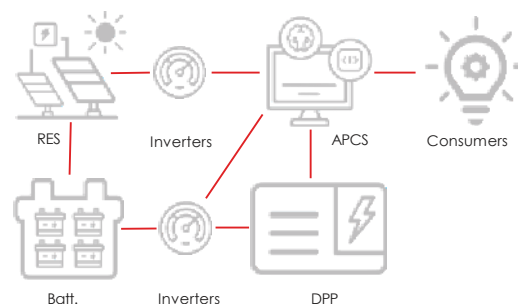
A solar power plant (SPP) with electricity storage (energy storage system - ESS) significantly reduces the load on the diesel generator sets (DGS), particularly in spring and summer. Excess energy from RES is stored in the ESS to ensure stable operation during periods of low solar irradiance.

In winter, the ESS functions as a balancing source/load to optimize DPP start/stop cycles and minimize specific fuel consumption for power generation while maintaining required power quality.

ESS includes a bidirectional power converter - inverter/rectifier and an array of rechargeable batteries (Batt.). The ESS provides optimum performance for a specific task.

The SAHPS APCS provides coordinated management of all power sources to ensure normal power generation and optimal distribution, around the clock (24/7) synchronization, and parallel operation of different energy sources.

A stand-alone power supply system is the modern solution for reliable and efficient electricity supply to remote and isolated areas



SAHPS Oymyakon. SPP



# ENELT Group SAHPS standardization and unification

## Easy operation

- SAHPS modular design.
- The components of all SAHPS subsystems is installed in prefabricated modules – shipping containers, and is then tested.
- The power center houses a machine hall, inverter-based ESS, maintenance bay, switchgear, control room, and other facilities.
- The personnel area includes a recreation room, a diner, and a heated bathroom.
- The personnel operates from within a self-heated enclosure, which is particularly critical in this extreme cold environment.
- Backup heat supply source.

## Low lead time and cost

- Prefabricated modules are installed and connected at the construction site in accordance with the design.
- Significant reduction in the module production (mass-line production) and power facility construction time.
- Cost reduction for project implementation.

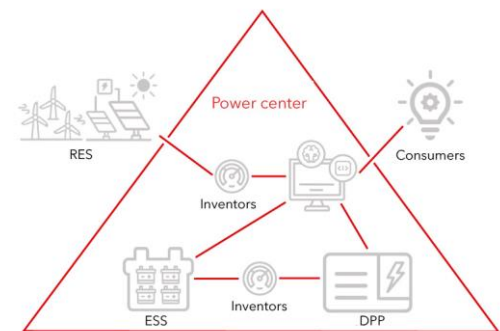
## Higher quality

- The quality of a commissioned facility is enhanced due to the use of prefabricated modules.

## Durability

- The service life of the power center is 15-20 years.

The ENELT SAHPS Power Center is a multifunctional, compact, and fully pre-fabricated self-sustaining energy complex. Prefabricated modules with SAHPS equipment – shipping containers – are tested and delivered to the construction site.



SAHPS Oymyakon. Power center



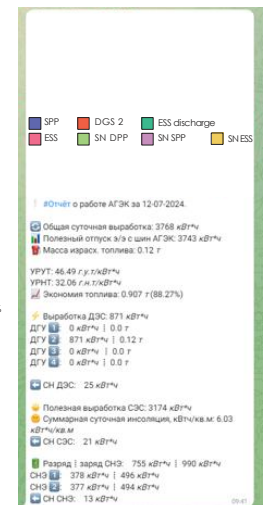
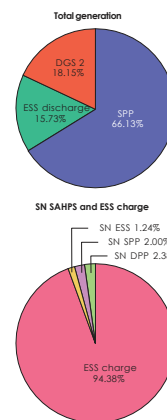
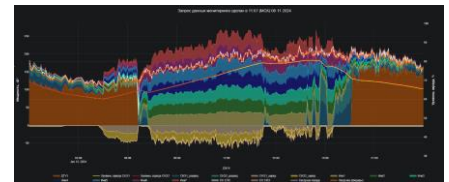
# Proprietary SAHPS management software

## Key functions of ENELT SAHPS APCS

- Centralized operational and supervisory monitoring of SAHPS operating parameters.
- Conversion equipment control parameter regulation. This applies specifically to the ESS and solar inverters, and includes the SAHPS operating mode prediction and optimization algorithm.
- Regulation of DPP control parameters to maintain optimal process conditions using SAHPS operating mode prediction and optimization algorithms.
- Comprehensive management of the hybrid power plant to maximize solar energy generation and distribute load between the SPP, ESS, and DPP, which is achieved by accounting for real-time and forecasted SPP output within the DPP's operational limits, using the SAHPS operating mode prediction and optimization algorithm.
- Automated utility metering (electricity, heat, diesel fuel, automated information and measuring system of commercial electric power metering).
- Limit process parameter value and equipment status alarms: on the automated workplace (AWP) display with log entry to the database management system (DBMS).
- Display of received and processed data: on the AWP display, APCS control panel, remote operator display (via the web interface).
- Providing the operation service with the necessary process data, design parameters and electronic reports.
- Providing of communication with related systems: including the RusHydro Group's automated system for local generation facilities operation process performance metrics monitoring (ASKTEP RusHydro).

Each SAHPS is managed by an ENELT Group's proprietary intelligent system

SAHPS APCS: implementation examples Web interface and Telegram bot



# ENELT manufacturing sites

## Switchgear manufacture



## SAHPS manufacture



# Completed ENELT SAHPS projects in 2024

## TOTAL POWER

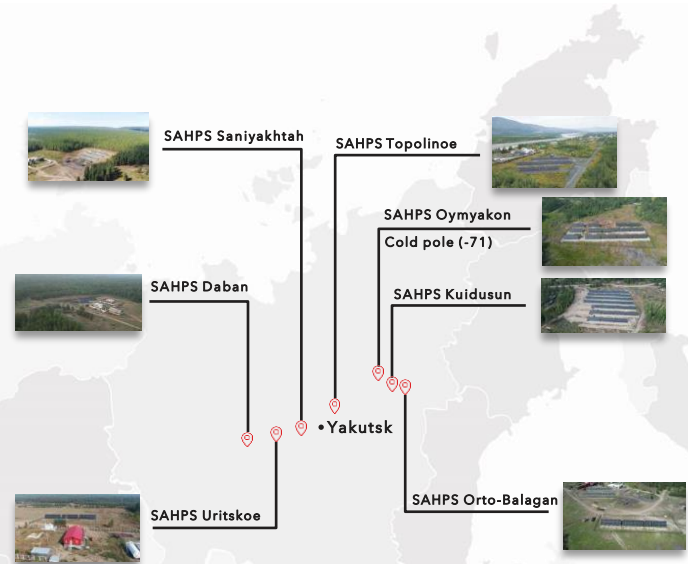
**Diesel power plants (PRP) 7158 kW**

## TOTAL POWER

**Solar Power Plants 1353 kW**

## TOTAL POWER

**Energy storage systems 1300 kW**



Facility	DPP (COP), kW	DPP (PRP), kW	SPP power, kW	ESS power, kW	ESS capacity, kW*h
SAHPS Kuidusun	1500	2000	561	500	760.3
SAHPS Oymyakon	750	1000	231	150	276.5
SAHPS Orto-Balagan	443*	590	50	100	138.2
SAHPS Topolinoe	1384*	1845	198	250	345.6
SAHPS Daban	450	600	66	100	207.0
SAHPS Saniyakhtah	600	800	198	150	276.5
SAHPS Uritskoe	263*	350	50	50	138.2

\*Some DPPs were not included in the scope of ENELT Group

# Completed ENELT SAHPS projects in 2024

## SAHPS Topolinee



### SAHPS equipment:

#### Diesel power plant

DPP (SOR)	1384 kW
DPP (PRP)	1845 kW

#### Solar power plant

SPP power	198 kW
-----------	--------

#### Energy storage system

ESS power	250 kW
ESS capacity	345.6 kWh

## SAHPS Oymyakon



### SAHPS equipment:

#### Diesel power plant

DPP (SOR)	750 kW
DPP (PRP)	1000 kW

#### Solar power plant

SPP power	231 kW
-----------	--------

#### Energy storage system

ESS power	150 kW
ESS capacity	276.5 kWh

## SAHPS Kuidusun



### SAHPS equipment:

#### Diesel power plant

DPP (SOR)	1500 kW
DPP (PRP)	2000 kW

#### Solar power plant

SPP power	561 kW
-----------	--------

#### Energy storage system

ESS power	500 kW
ESS capacity	760.3 kWh

## SAHPS Saniyakhtah



### SAHPS equipment:

#### Diesel power plant

DPP (SOR)	600 kW
DPP (PRP)	800 kW

#### Solar power plant

SPP power	198 kW
-----------	--------

#### Energy storage system

ESS power	150 kW
ESS capacity	276.5 kWh

## SAHPS Daban



### SAHPS equipment:

#### Diesel power plant

DPP (SOR)	450 kW
DPP (PRP)	600 kW

#### Solar power plant

SPP power	66 kW
-----------	-------

#### Energy storage system

ESS power	100 kW
ESS capacity	207 kWh

# Completed ENELT SAHPS projects in 2024

## SAHPS Uritskoe



### SAHPS equipment:

#### Diesel power plant

DPP (SOR)	263 kW
DPP (PRP)	350 kW

#### Solar power plant

SPP power	50 kW
-----------	-------

#### Energy storage system

ESS power	50 kW
ESS capacity	138.2 kWh

## SAHPS Orto-Balagan



### SAHPS equipment:

#### Diesel power plant

DPP (SOR)	443 kW
DPP (PRP)	590 kW

#### Solar power plant

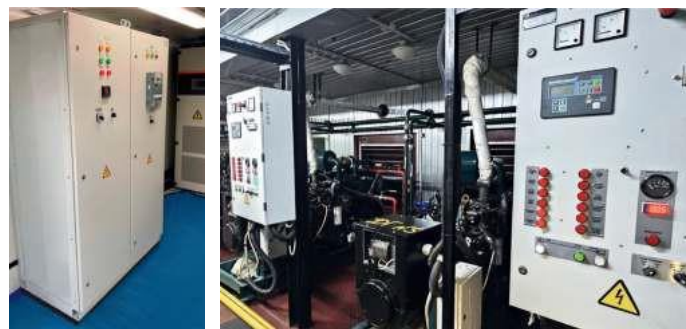
SPP power	50 kW
-----------	-------

#### Energy storage system

ESS power	100 kW
ESS capacity	138.2 kWh

# Social and economic effects of SAHPS commissioning

- Provision of guaranteed power supply to consumers in remote areas not connected to the services of Unified Energy System of the Russian Federation. Switch to 24/7 mode.
- Significantly shorter SAHPS deployment timelines achieved through highly prefabricated modular design.
- Halving the diesel power plant (DPP) operating time in summer - from 24 to 12 hours daily - multiplies fuel savings and extends engine life.
- Reduction of diesel fuel consumption by up to 88% in summer and approximately 15% in winter.
- Reduction in cost of fuel purchase and delivery to the region.
- Reduction in operating costs and equipment repair costs.
- The use of lithium-ion storage devices with high efficiency and durability performances enables efficient solar energy utilization and the DPP fuel efficiency optimization.
- Project payback period is 12-15 years.
- Reduction of atmospheric emissions.



## Our clients



1. **Introduction**

2. **Background**

3. **Methodology**

4. **Results**

5. **Discussion**

6. **Conclusion**

7. **References**

8. **Appendix**

9. **Index**

10. **Index**

11. **Index**

12. **Index**

13. **Index**

14. **Index**

15. **Index**

16. **Index**

17. **Index**

18. **Index**

19. **Index**

20. **Index**

21. **Index**

22. **Index**

23. **Index**

24. **Index**

25. **Index**

26. **Index**

27. **Index**

28. **Index**

29. **Index**

30. **Index**

31. **Index**

32. **Index**

33. **Index**

34. **Index**

35. **Index**

36. **Index**

37. **Index**

38. **Index**

39. **Index**

40. **Index**

41. **Index**

42. **Index**

43. **Index**

44. **Index**

45. **Index**

46. **Index**

47. **Index**

48. **Index**

49. **Index**

50. **Index**

51. **Index**

52. **Index**

53. **Index**

54. **Index**

55. **Index**

56. **Index**

57. **Index**

58. **Index**

59. **Index**

60. **Index**

61. **Index**

62. **Index**

63. **Index**

64. **Index**

65. **Index**

66. **Index**

67. **Index**

68. **Index**

69. **Index**

70. **Index**

71. **Index**

72. **Index**

73. **Index**

74. **Index**

75. **Index**

76. **Index**

77. **Index**

78. **Index**

79. **Index**

80. **Index**

81. **Index**

82. **Index**

83. **Index**

84. **Index**

85. **Index**

86. **Index**

87. **Index**

88. **Index**

89. **Index**

90. **Index**

91. **Index**

92. **Index**

93. **Index**

94. **Index**

95. **Index**

96. **Index**

97. **Index**

98. **Index**

99. **Index**

100. **Index**



[www.enelt.com](http://www.enelt.com)