





# **Estorsys: Brief Overview**

- Technological engineering company
- Founded in 2016. Facility and head office Novosibirsk, Russia
- Employees 24 people. Forecast for 2020 48 people
- Facility 1445 m2. Offices 418 m2
- Mission:

Estorsys is a technological engineering company. Our main goal is to provide a full range of engineering services in the field of Electrical Energy Storage Systems (EESS), including feasibility study, engineering, manufacturing and turnkey solutions.

#### **Experience:**

- Research laboratory for EESS with the Novosibirsk State Technical University
- More than 10 years of R&D concerning inverters and control systems
- Designing and fabrication of EESS











# Smart Components for Customized Solutions



# **Estorsys Produces Smart Components for ESS**

- Control System Flexible ESS adjustment, two-way information exchange with middle and top tier systems (ACS, SCADA, Regional Dispatch Office, etc.)
- Battery Management System
  Monitoring, balancing and protection of battery components (cells)
- Converter System
  Provides bilateral AC/DC conversion
- Custom-built Containers
  Weather-proof design







# **ESS Standard Use**



# \* Estorsys

#### **ESS have standard Use**

- Energy backup
- Load shifting / peak shaving
- Dynamic Load Compensation
- Frequency and voltage stabilization
- Automatic limitation of load change rate (critical for gas-based equipment)
- Automatic stabilization of generation pattern
- "Spinning" reserve replacement



Power Grid









# **Energy Storage Solutions**

#### **Applications**









Storage solutions for installation & renewable generation plants

- Backup power
- Power load leveling in drilling
- Replacement of spinning reserve
- Micro grids
- Industrial and municipal power plants

- Smart grids
- Backup power

#### • Lithium-ion batteries

• Supercapacitors

#### **Unique operation algorithms**

Estorsys

- Fast response time: 5 ms
- ESS 400V output is standard voltage class

**Technology** 

- Power factor flexible range from ±0,5 to ±1
- Efficiency factor of main system to 94% per cycle
- Up to 4x life extension for batteries thanks to balancing service
- Customized battery management system
- Upper level control system
- Unique bilateral inverter design

## **ESS Application for Renewable Power**



#### **ESS** features

- Renewable power irregularity alignment
- Electricity and power balancing
- Provides power system stability
- Electricity quality control
- Genset load sharing optimization
- Backup power

Renewable power integration into local power systems







# **ESS Application for Power Grid**

#### **ESS features**

- Load peak shaving
- Load shifting
- Reactive power flow control
- Reducing losses in electricity distribution
- Power backup mode
- Real-time grid voltage and frequency alignment
- Power quality events mitigation
- Postponing of new line connections





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# ESS Application for Oil & Gas

## **ESS** features

Load peak shaving

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- Reduction of installed gensets number
- Decrease in losses in electrical lines
- Extension of gensets life
- Improving the quality of electricity
- Usage of gas-piston gensets in drilling
- Backup power for power stations









# **ESS Application for Distributed Generation**

#### **ESS features**

- Gensets power load alignment
- Optimization of diesel and gas genset operation
- Diesel genset fuel consumption can decrease by up to 50%
- Decrease in running gensets quantity
- Opportunity to use gensets with less power
- Lengthening of genset life

Estorsys HERE PAT **Diesel and Gas gensets**  $P_{gen}$ ESS 11

# ESS Main Applications by Power Industry Segments





Power generation	Distribution	Consumption
Power balancing	Decrease in losses in electrical lines	Reduction of connection fees
Frequency control	Increase in electric lines capacity	Load peak shaving
Power system stable operation	Greater reliability of the transformer stations	Power outage backup
Power diversion compensation	Decrease in power load on electric lines and transformers	Current flow balancing between phases
Genset backup	Postponing of new electric lines construction	Reactive power flow control
Genset load optimization	"Spinning" reserve decrease	Genset operating mode optimization
Renewable power integration into the grid	Pollution abatement	Reliable power supply for 1 and 2 category consumers
Reactive power compensation	Release of power from the transformer stations	Money saving due to electric tariff arbitrage terms

# **Product Range**



# Estorsys

#### Low voltage EESS

N₽	EESS model	Voltage, kV	Nominal apparent power, kVA	Nominal energy capacity, kW*h
1	EESS-0,4-100/100-XXX	0,4	100	126, 138, 253, 414
2	EESS-0,4-200/YYY-XXX	0,4	200	124, 218, 460
3	EESS-0,4-400/YYY-XXX	0,4	400	230, 291, 460
4	EESS-0,4-800/YYY-XXX	0,4	800	449

#### Medium voltage EESS\*

NՉ	EESS model	Voltage, kV	Nominal apparent power, kVA	Nominal energy capacity, kW*h
1	EESS-6,3-400/YYY-XXX	6,3	400	291, 414
2	EESS-6,3-800/YYY-XXX	6,3	800	583,829, 921
3	EESS-6,3-1200/YYY-XXX	6,3	1200	614, 768, 829, 921
4	EESS-6,3-1600/YYY-XXX	6,3	1600	1228, 1536, 1843, 1658
5	EESS-6,3-2400/YYY-XXX	6,3	2400	1228, 1843, 2304, 2488
6	EESS-10,5-400/YYY-XXX	10,5	400	291, 414
7	EESS-10,5-800/YYY-XXX	10,5	800	583,829, 921
8	EESS-10,5-1200/YYY-XXX	10,5	1200	614, 768, 829, 921
9	EESS-10,5-1600/YYY-XXX	10,5	1600	1228, 1536, 1843, 1658
10	EESS-10,5-2400/YYY-XXX	10,5	2400	1228, 1843, 2304, 2488

\* Will be launched in the second half of 2020.





# **Estorsys Proposal for Customers**



# \* Estorsys

#### **Services**

- Research & development
- Feasibility study
- Site survey
- Project design
- Certification
- Turnkey solution
- After-sales support
- Equipment monitoring
- Consulting

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			Москва Стандарлинформ 2018	

### **Products**

- Product line "Estorsys"
- Rated voltage 0,4/6,3/10 kV
- Frequency 50 Hz
- Power 100-2400 kVA
- Capacity 10-30000 kWh







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