

QUESTIONS

LET'S HONESTLY ASK
OURSELVES SOME QUESTIONS.

Are we satisfied with what is happening with our Planet?
Plastic in the ocean, poisoned soil, toxic air ...

We all talk about sustainability.
Does everything that we do really lead us to these goals?

Do you know at least one of the modern efficient
batteries that can be called sustainable?
Any of the lithium-ion systems?
Any acid or alkaline system? Maybe a hydro power plant?

What's more important, profit or a healthy Planet?

What if we would not have to choose between profit and ecology?
What if both are possible at the same time?

Let's figure it out.

PROBLEM

EXISTING ACCUMULATORS NOW ARE THE
WEAKEST ELEMENT IN RENEWABLE
ENERGY FIELD.

Batteries are the missing
piece of long-awaited
FREEDOM!

- Too expensive
- Unreliable
- Dangerous
- It explodes
- It pollutes the environment
- It burns
- It poisons
- It leads to dependence on suppliers of raw materials from only a few countries
- It takes our money and pollute the Earth.



The World's First

Renewable
&
Sustainable

Battery



NEW SORBSYS™
BATTERIES
FOR ENERGY
STORAGE.

TECHNOLOGY.

Surface of pores in 1 gram
of our carbon
is 3000 sq.m.
World's best ionic
sorption.

THE MAIN PURPOSE OF SORBSYS BATTERIES IS AN INTRADAY
ACCUMULATION OF ELECTRICITY, BALANCING, SMOOTHING
DEMANDS AND GENERATION PEAKS, GRID STABILIZATION, ETC

The basis of our batteries is electric cells developed by a team of talented
scientists and engineers from Ukraine.

Synthesis of our own mesoporous carbon material with
a specific surface area of more than 3000 sq.m/g.
allowed to create efficient energy storage.

Quantachrome® ASiQwin™ Automated Gas Sorption
Acquisition and Reduction
© 1994-2012 Quantachrome Instruments
Version 6.0.0

Analysis Report
Sample ID: AH-5
Filename: A7C04011.RAW
Operator: Tsyba

Volume/Area summary

Surface Area Data

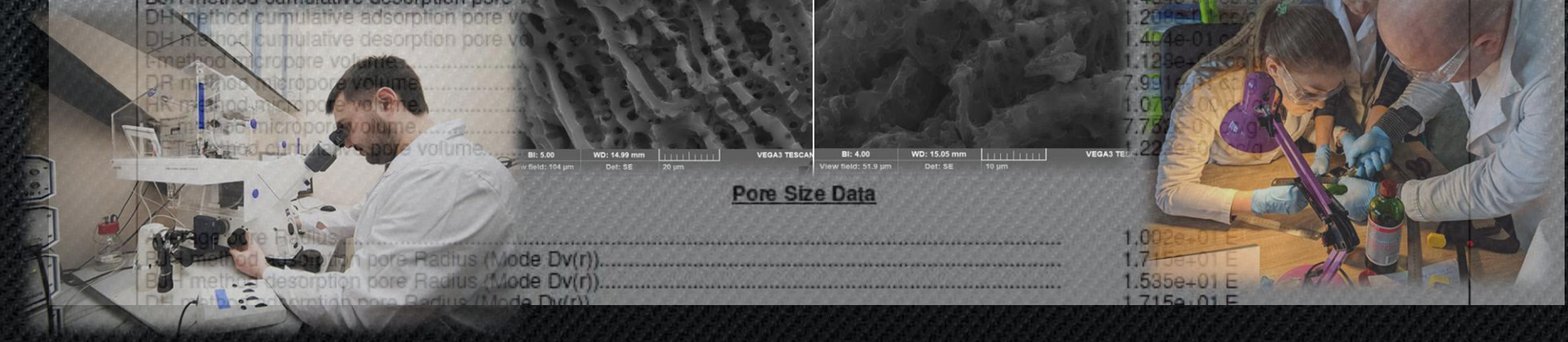
MultiPoint BET	2.625e+03 ml/g
BJH method cumulative desorption surface area	6.600e+01 ml/g
DH method cumulative adsorption surface area	1.021e+02 ml/g
DH method cumulative desorption surface area	6.762e+01 ml/g
t-method external surface area	1.049e+02 ml/g
DR method micropore area	1.705e+02 ml/g
DR method micropore area	2.455e+03 ml/g
DR method micropore area	2.243e+03 ml/g
DR method micropore area	3.071e+03 ml/g

Pore Volume Data

Total pore volume for pores with Radius less than 1333.82 Å at P/Po = 0.992749	1.316e+00 cc/g
BJH method cumulative adsorption pore volume	1.239e-01 cc/g
BJH method cumulative desorption pore volume	1.434e-01 cc/g
DH method cumulative adsorption pore volume	1.204e-01 cc/g
DH method cumulative desorption pore volume	1.404e-01 cc/g
t-method micropore volume	1.128e-01 cc/g
DR method micropore volume	7.991e-02 cc/g
DR method micropore volume	1.073e-01 cc/g
DR method micropore volume	7.753e-02 cc/g
DR method micropore volume	1.223e-01 cc/g

Pore Size Data

DR method micropore Radius (Mode Dv(r))	1.002e+01 Å
DR method micropore Radius (Mode Dv(r))	1.715e+01 Å
DR method micropore Radius (Mode Dv(r))	1.535e+01 Å
DR method micropore Radius (Mode Dv(r))	1.715e+01 Å



SORBSYS VS LI-ION

Active ions in the Sorbsys system can enter the pores from **aqueous** solutions.

Sorbsys use simple, renewable materials, even agricultural wastes, that are cheap and safe.

All raw materials can be local

The manufacture, operation and recycling of our batteries do not affect the environment.

Potentially the cost of our batteries could drop below \$25/kWh.

Sorbsys Batteries do not need a balancing system.

The battery can operate in a wide range of temperatures.

The battery does not require a cooling system.

Ions of Lithium can be intercalated into the interlayer space of materials mostly from aprotic toxic and flammable solvents.

Li-ion batteries use rare materials that are expensive and also pollute nature after the end of their service life.



SAFETY.

One of the main advantages of Sorbsys batteries is a radically different level of safety.

- Batteries have no metallic elements.
- The basis is activated carbon and graphite.
- Water-based electrolyte eliminates any risk of battery burning.
- Any mechanical damage cannot cause the battery cells to ignite.
- Batteries can be discharged to 0 Volts without any negative effects.
- Positive and negative terminals can be short-circuited without consequences
- Sorbsys does not contain Cobalt and any of its compounds.
- Bromine and Zinc ions are in a state of salt solution, bound in safe compounds and are inside the pores.
- Does not contain heavy metals.



COST.

Most market experts claim that the key factor for the energy storage systems is the cost per unit of capacity and the cost per cycle.

The use of cheap but efficient materials dramatically reduce the cost of batteries.

- Cheap raw materials.
- Simple technology
- Water electrolyte.
- A large resource base, which is constantly renewing.



The pack-level price is less than

69 USD/kWh

\$57/kWh in 2022

\$45/kWh in 2023

ECOLOGY.

One of our main aims is to make a radical solution of the eco problems for the batteries story.

Our energy storage system is eco-friendly at all of its stages. During production, exploitation and recycling.

Most of the items used in Sorbsys cells are available in pharmacies.

- Activated carbon.
- Salts of iodine, bromine, zinc, calcium.
- Water.
- Graphite.

All cells are easy to recycle, this could be used for new batteries, and most materials can be reused.

Just
carbon, graphite,
water and salt.



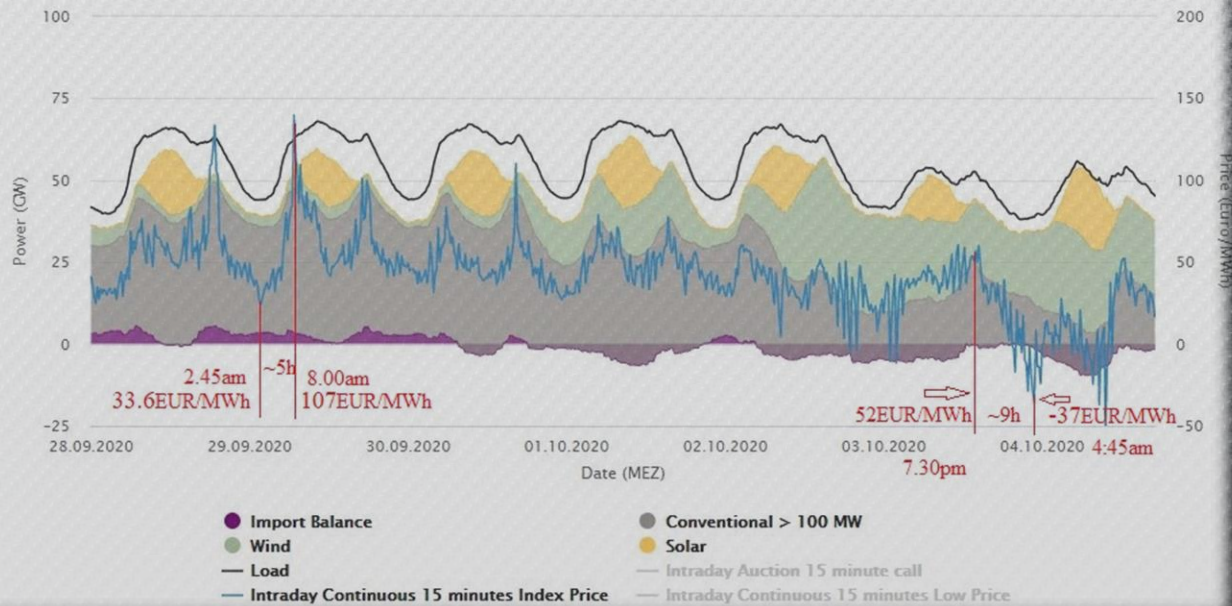
Let's make our planet better and cleaner

BUSINESS



Energy-Charts Power Energy Emissions Climate Prices Scenarios Map Infos

Electricity production and spot prices in Germany in week 40 2020

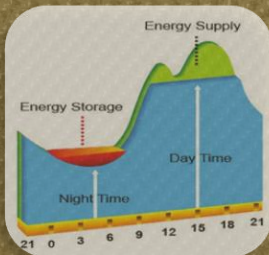


The more we use renewable energy sources, the more unstable the electrical grid becomes.

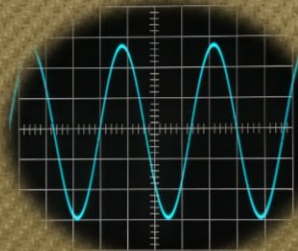
Batteries are the key factor in keeping the grid stable.

BATTERIES AS A HI-TECH MONEY-MAKING SYSTEM.

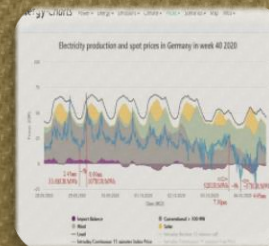
Money for a
Demand Response
& Peak Shaving.



Money for
services of
maintaining the
frequency of
networks.



Money from
electricity
market trading.



Money from
virtual electric
plants.



Using remote control and AI
you have an incredibly
powerful instrument.

BUSINESS MODEL

EXAMPLE FOR UKRAINE.



ENERGY ACCUMULATION AT NIGHT
USING THE REDUCED COST:

FOR COMPANIES THE COST OF 1 KW*H = 0.022 USD

(without VAT; on 19/Oct/2018; 2nd voltage class; 3-zone fare).

Sale to the
householders at
the price
of 0.054 USD

Sale to
businesses at
the price
of 0.079 USD

Charging EV
at the price
of 0.125 USD

SELLING ENERGY TO PRIVATE HOMEOWNERS.



CALCULATION FOR 1 KW*H OF INSTALLED BATTERY CAPACITY:

	Value	Units
Time of work at night:	8	hours
Accumulated overnight:	8	kW*h
Price 1kW*h from the electrical grid:	0.022	USD
The sale price of 1 kWh.:	0.054	USD
Profit gross from 1 kWh incl. efficiency:	0.028	USD
Profit gross for one night:	0.23	USD
The cost of a set of equipment for 1 kW * h:	230	USD
Payback period:	2,8	years

Profit: 0,028 USD per 1 kW*h

SELLING ENERGY TO BUSINESSES.

CALCULATION FOR 1 KW*H OF INSTALLED BATTERY CAPACITY:



	Value	Units
Time of work at night:	8	hours
Accumulated overnight:	8	kW*h
Price 1kW*h from the electrical grid:	0.022	USD
The sale price of 1 kWh.:	0.079	USD
Profit gross from 1 kWh incl. efficiency:	0.057	USD
Profit gross for one night:	0.365	USD
The cost of a set of equipment for 1 kW * h:	230	USD
Payback period:	1,7	years

Profit: 0,057 per 1 kW*h

SELLING ENERGY TO ELECTRO VEHICLES.

CALCULATION FOR 1 KW*H OF INSTALLED BATTERY
CAPACITY:



	Value	Units
Time of work at night:	8	hours
Accumulated overnight:	8	kW*h
Price 1kW*h from the electrical grid:	0.022	USD
The sale price of 1 kWh.:	0.125	USD
Profit gross from 1 kWh incl. efficiency:	0.083	USD
Profit gross for one night:	0.66	USD
The cost of a set of equipment for 1 kW * h:	240	USD
Payback period:	1,0	years

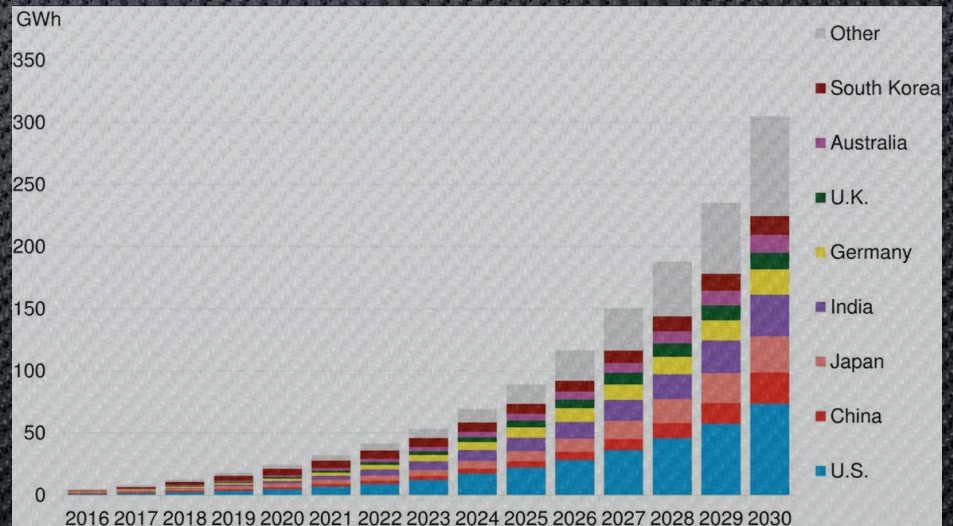
Profit: 0,083 per 1 kW*h

MARKET:

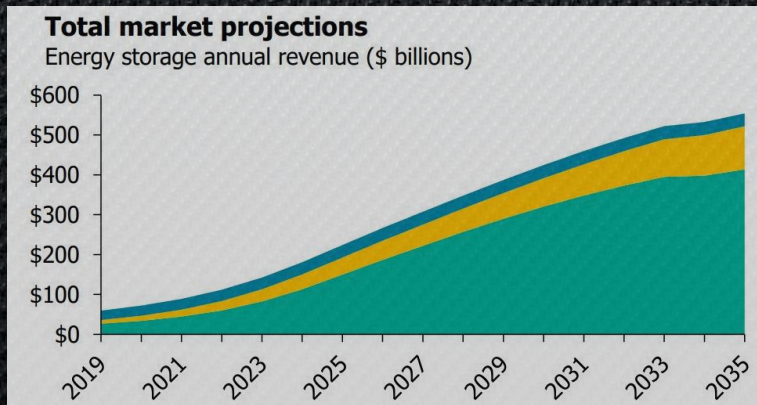
By 2030, the global storage market will grow sixfold.

BloombergNEF

\$600 Billions in 2035
market annual revenue projection.



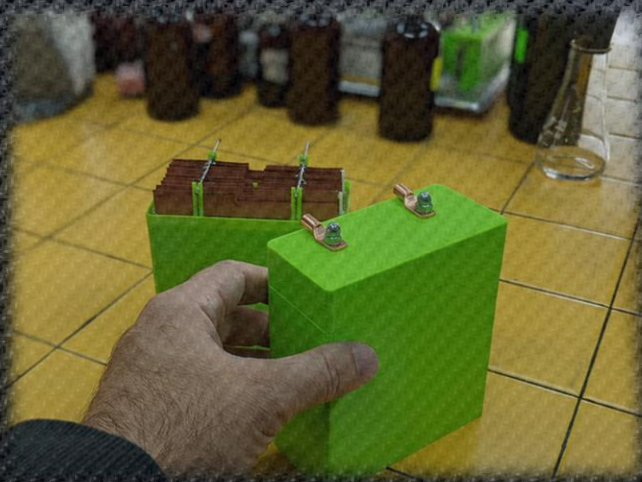
Lux research.



CURRENT SITUATION

FOR JANUARY 2021

We already producing the 150Wh elements that are big enough to be assembled into industrial-scale energy storages, 1MWh and more.



We assembled 8 of these cells into a battery pack. Serial connection. There was no loss of efficiency. Moreover, we noted a certain increase in efficiency when they work together.



PARAMETERS:

JANUARY 2021

#	Parameter	Min	Ave(Nominal)	Max
1	Specific volumetric energy density, Wh/L	80	100	120
2	Specific gravimetric energy density, Wh/kg	21	30	50
3	Electric (Coulombic) efficiency, %	92	98	99,4
4	Energy efficiency, %	81	86	90.3
5	Discharge depth, DOD, %	80	95	100
6	Voltage of a primary cell, V	0	1.75	2
7	Number of cycles	1000	5000	10 000+
8	Cost of 1kW*h of capacity, USD	68	85	98
9	Time of charging, h	1	4	10
10	Time of discharging, h	0.1	4	10
11	Self-discharging, %/h	0.8	0.5	1.2
12	Lifetime, years	5	10	20+
13	Ambient temperature, °C	-20	24	55
14	Cycles per 24h	1	2	4
15	Relaxing time after discharging, h	4	6	8

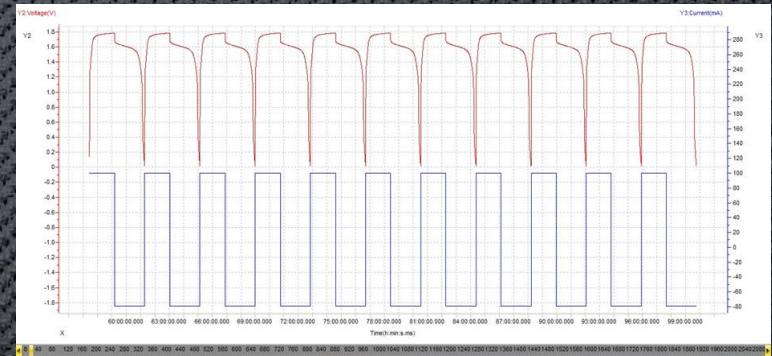


BATTERY OPERATION:

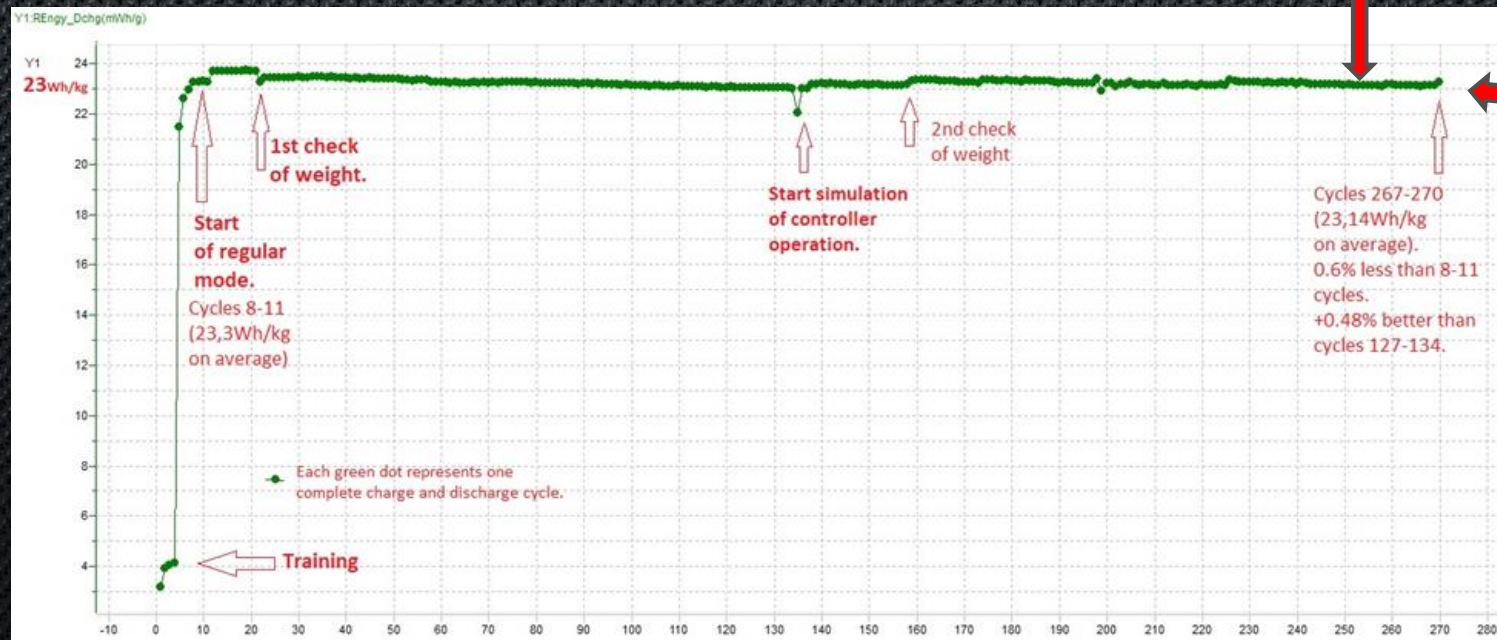
One single cycle



10 cycles



First 270 cycles



Most of lead acid batteries are dead after this point.

We lost nothing.

RENEWABLE



SUSTAINABLE

The Sorbsys battery does not have elements that degrade during operation.

The Sorbsys batteries are made from agricultural waste and can be returned to agriculture as fertilizer.

Controller using AI provides periodic renewal battery state, by adjustments the ratio of more than 15 parameters.

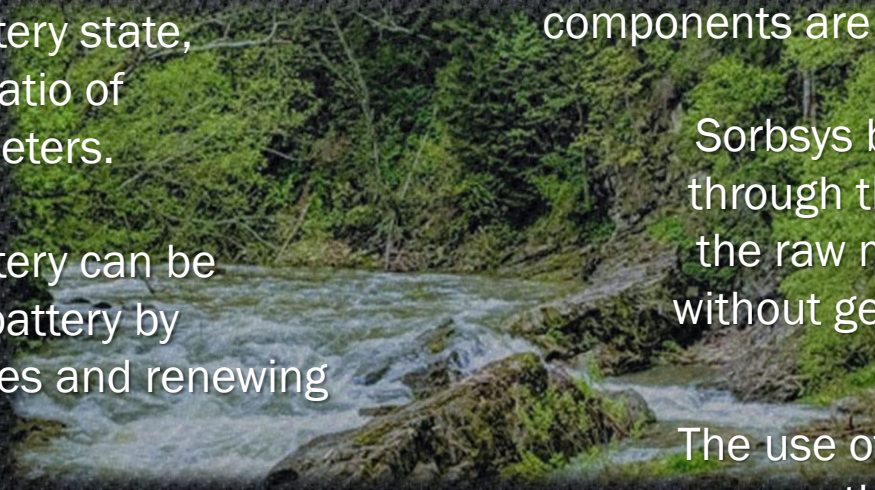
After full life, the battery can be recycled into a new battery by flushing the electrodes and renewing the electrolyte.

Or can be utilized of, for example, as fertilizer for agrobusiness or for pharmacy purposes.

None of the Sorbsys battery components are not-returning waste.

Sorbsys batteries may can go through the full life cycle from the raw materials to recycling without generating new waste.

The use of batteries increases the efficiency of using renewable energy sources, increases the sustainability of human life.



ABOUT US:

We are the group of scientists from several institutes and universities, united in project Sorbsys by the dream to develop safe and cheap batteries. We have our own platform, and we also work in cooperation with various scientific institutions.

Some of our scientists are the fathers of Soviet lithium-ion batteries.

Our team includes physicists, chemists, materials scientists, electrochemists. In total about 20 scientists and engineers.

We already received world-class results on many aspects of batteries and their components. And we continue to make discoveries every day.



WHAT'S NEXT:

Our next step is to start a pilot production with a capacity of 1 MWh per month.

We have already received pre-orders for 12MWh from several potential partners.



Sergey Kaminsky
Sorbsys
CEO

I will be happy to work together with partners from all over the World. Let's make people happier and the World a better place.