

Engineering & Technical Complex "AVTOMATIKA"

We spare no energy, so you
don't waste your energy

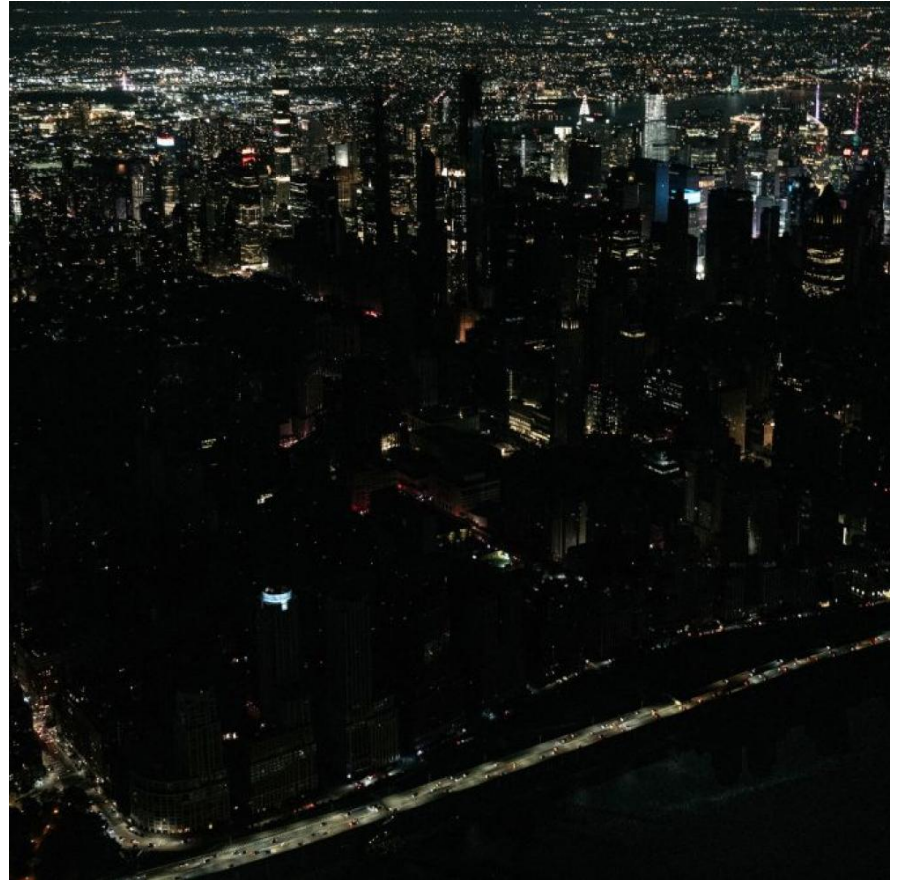
An aerial photograph of a solar farm, showing rows of solar panels stretching across a landscape. The image is overlaid with a semi-transparent blue filter. The text is centered on the left side of the image.

Cool Energy

long-term solar energy storage

Introduction

Mass production of solar energy has caused an imbalance in electricity generation and usage during the day and night.



Problem

Existing energy storage solutions are expensive, have a limited resource and durability.

Market

According to Navigant Research, by 2025, the global energy-storage market will be \$80 billion, and \$50 billion per year will come from stationary batteries.

Source 

McKinsey Global Institute, named energy-storage one of 12 technologies that could drive truly massive economic transformations and disruptions in the coming years.

Source 

Technology

The storage of excess solar electrical energy takes place in the form of ice of a special form, obtained using known refrigeration units and / or the COOL ENERGY plant tested by us.

The resulting ice is stored in an ice accumulator and used at night to cool the water supplied to the air conditioning and cooling systems of buildings.

TECHNOLOGY

Possible additional COOL ENERGY functions

1 Making ice with the COOL ENERGY unit from the freezing air of the high latitudes and high mountains, the Midwest states and after the evaporators of air source heat pumps (AHP) heating systems.

2 Use in frosty regions of the heat of water crystallization (333 kJ/kg) for air heating in front of ventilation, air conditioning, heating systems at AHP to temperatures below minus 5°C.

3 Transportation from frosty regions of produced ice 20-400000t in thermally insulated containers to any distance by land and water (\$ 0.05 t/km).

4 Increasing the efficiency of solar PV panels by cooling them

TECHNOLOGY

How it works

STAGE 1

During the day solar panels generate excessive energy.

STAGE 3

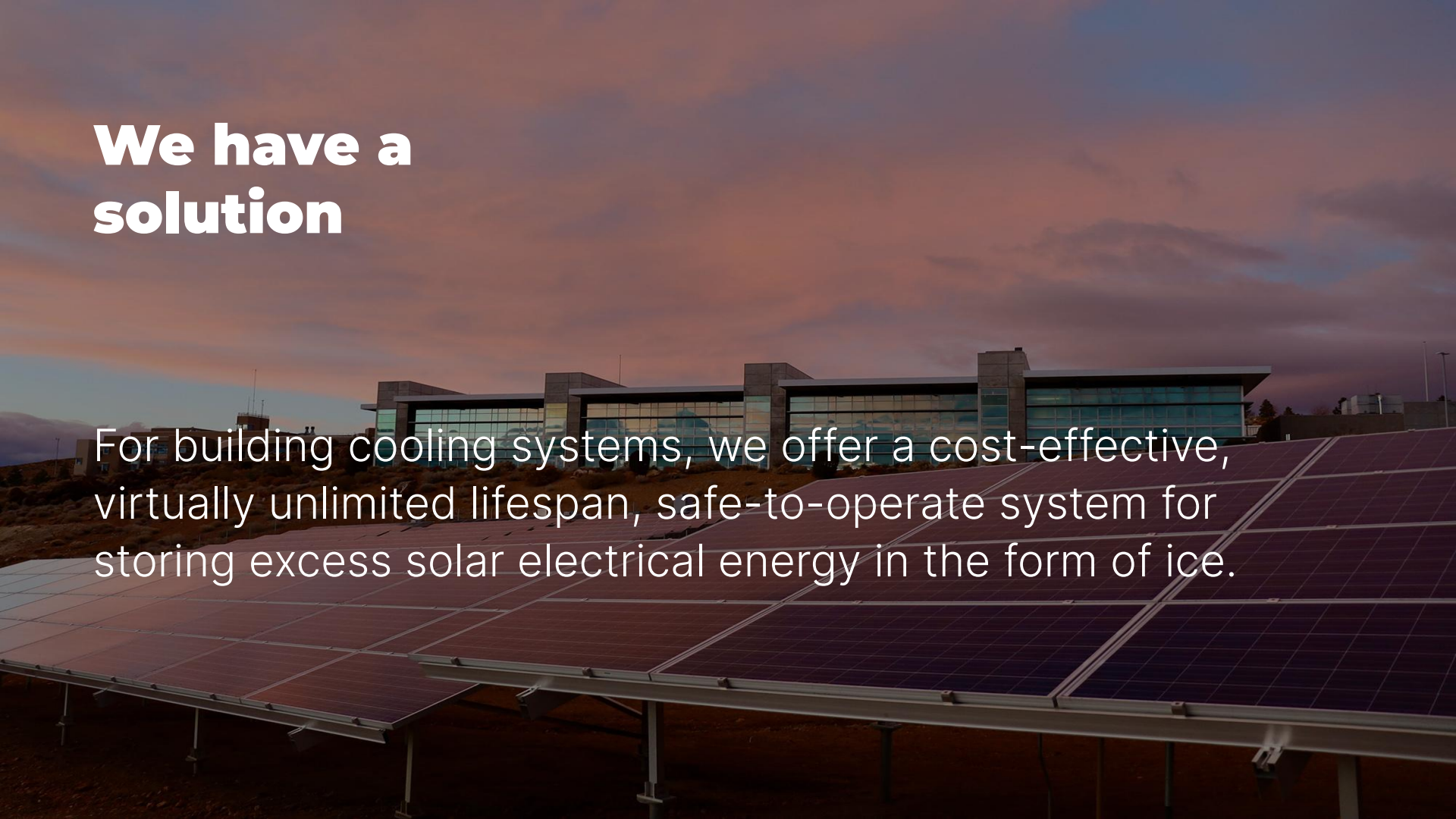
The ice is stored in the ice accumulator. Later it can be used for air conditioning or cooling a building during peak energy consumption periods and at night, when the solar panels are not working.

STAGE 2

Ice-making machine produces ice from excessive energy.

We have a solution

For building cooling systems, we offer a cost-effective, virtually unlimited lifespan, safe-to-operate system for storing excess solar electrical energy in the form of ice.



Development plan

SEPTEMBER, 2022

Design of the COOL ENERGY prototype.

NOVEMBER, 2022

Production of the device prototype.

DECEMBER, 2022

Testing of the device prototype.



Existing Solutions

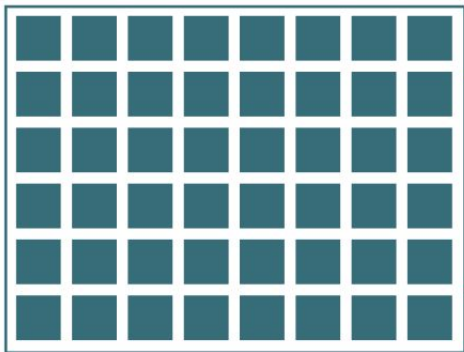
Compared to existing solutions for storing excess solar electrical energy in the form of batteries, the COOL ENERGY installation provides an almost unlimited number of charge-discharge cycles, durability and safety of use at a low cost (\$50-100 per kW of installed power) and a commensurate energy density (90 W x hour/kg).

Current stage of the project

We created, tested, and patented a core technology. There is an experimental prototype of an ice-maker and scientific publications in Ukraine and the USA.

Our next steps are design, production and testing of the full COOL ENERGY prototype.

SOLAR BATTERY



☀️ Excess electricity

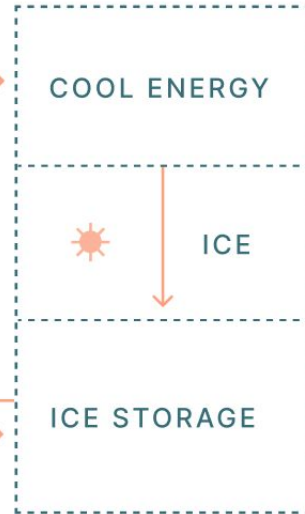


● Расчетная электроэнергия

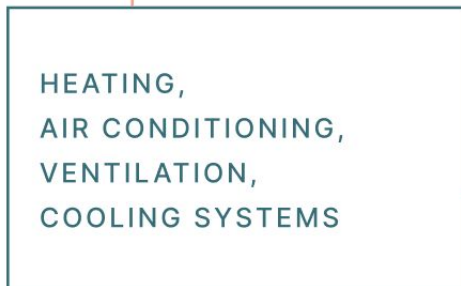
☀️ Rated electricity



☀️ Cold air



☀️ Вода



● Water



STRUCTURAL SCHEME

Long term storage installation
excess solar energy COOL ENERGY

Thank you!

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