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Damless hydroelectric power plant DHPP technology

DHPP TECHNOLOGY PECULARITIES

DAMLESS HYDROELECTRIC POWER PLANT TECHNOLOGY

the newest technology for producing cheap electricity;
the use of a renewable and infinite energy source of water flows;
compliance with modern environmental requirements;
energy complex that does not require the construction of a special dam;
placement in hard-to-reach places, in the currents of seas and oceans;
increasing the stability of the region's energy resources system due to diversification;
a significant excess of the power utilization factor compared to solar, wind and wave analogues;
ergonomics, convenience and functionality during use.

An illustration of one of the possible examples of the DHPP use

PROBLEMS SOLVED BY DHPP

provision of customers with cheap electricity;
increasing the electrical capacity of operating dam hydroelectric power stations;
electricity production in hard-to-reach places, in places without power grids, in mountainous areas;
production of electricity on the islands in the oceans and seas;
generation of cheap electricity for desalination of seawater in areas of fresh water scarcity;
the possibility of a gradual abandonment of nuclear energy;
environmental friendliness, no waste, no waste disposal;
new workplaces and orders for machine-building enterprises.

DHPP ECONOMIC CHARACTERISTICS

Indicator	Units	Value
Profitability	%	200...700*
Payback period (depending on the speed of the current)	years	1...4*
Cost of electricity produced	$ / kWh	less then 0,05*
The cost of electricity generated during the year: at a flow speed of 1.5 m/s to 3.0 m/s	$ million	0,8...3,1*
Annual average profit: at a flow speed of 1.5 m/s to 3.0 m/s	$ million	1,0...5,0
Total profit during operation	$ million	11,6...46,5*
Total average annual operating costs	$ million	0,2...0,5*

* Note: for a unit with an impeller diameter of 24 m

Full-scale experimental model of DHPP

DHPP ECONOMIC ADVANTAGES:

high profitability (over 300% on average);
fast payback period (2 years on average);
possibility of using "green" tariff;
low specific cost of 1 kWh electricity production (3-5 cents);
absence of auxiliary facilities maintenance costs;
high efficiency factor of the device (efficiency ~0.6);
high utilization ratio of the installed capacity of the technology (URIC ~ 1.0);
low specific material capacity (kg/kW);
low labor intensity of manufacturing and maintenance during operation.

DHPP TECHNICAL CHARACTERISTICS

RESOURCE AND CONSTRUCTIVE ADVANTAGES:

the possibility of using potentially inexhaustible sources of energy in the form of currents that do not depend on the seasons, time of day, weather, market conditions;

the possibility of attracting weak currents with speeds less than 0.65 m/s (for the first time in the world practice of generation),;

the possibility of expanding the scope of application due to the use of regions with complex hydrological conditions (subglacial position, bottom soils, areas of strong surface multidirectional waves, etc.);

application of simple methods of work during installation, maintenance, repair and dismantling provided by modern structural solutions;

the possibility of producing wide model range on the basis of an adaptive design scheme and modern technology for the production of assembly units;

simple logistics to the place of operation without additional specialized watercraft;

a small number of specialized purchased components.

Indicator	Units	Value
Weight of the structure	tons	85...216
Dimensions: impeller diameter height of the impeller	m	 18...36 3...15
The number of working wheels	pcs	from 2
Number of generators	pcs	2...12
Total power of the unit by flow rate: from 1.0 m/s to 3.0 m/s (for the working wheel diameter - 24 m)	MW	1,0...6,0
Average service life	years	15

* Note: for a unit with an impeller diameter of 24 m

MARKET

The market of sources of renewable electricity of high capacity

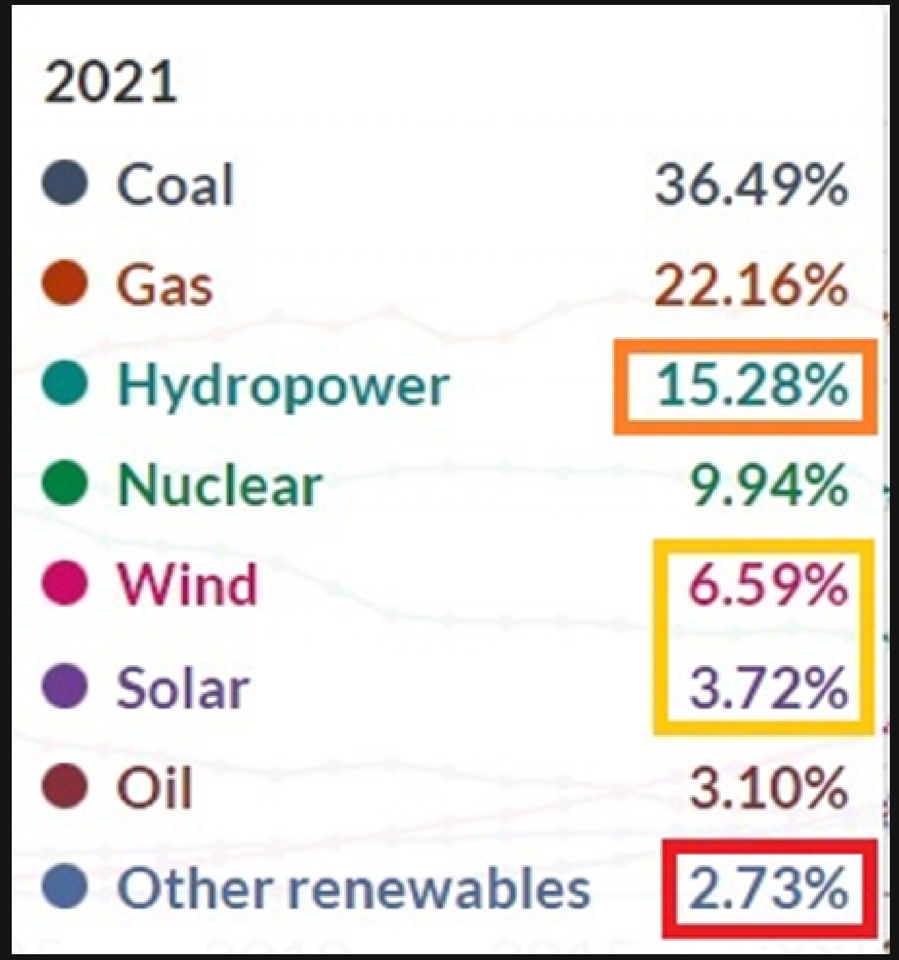
Consumers with a high need for electricity in places where there is no access to power grids, but there is access to water bodies with the minimum required flow rate

Additionally:

Power plants for underwater basing
Electricity market
Market of technologies for generating electricity
The market of service maintenance and repair of hydroelectric power plants

Target market share up to 2% of global electricity production

The share of electricity sources in the global market for 2021



COMPETITIVE ANALYSIS

Main competitors:

1. Tidal power plants
2. Hydro-accumulating power plants
3. Hydroelectric power stations
4. Power plants using wave energy

Alternative competitors:

1. Wind power plants
2. Solar power plants

Comparative analysis with a foreign analogue

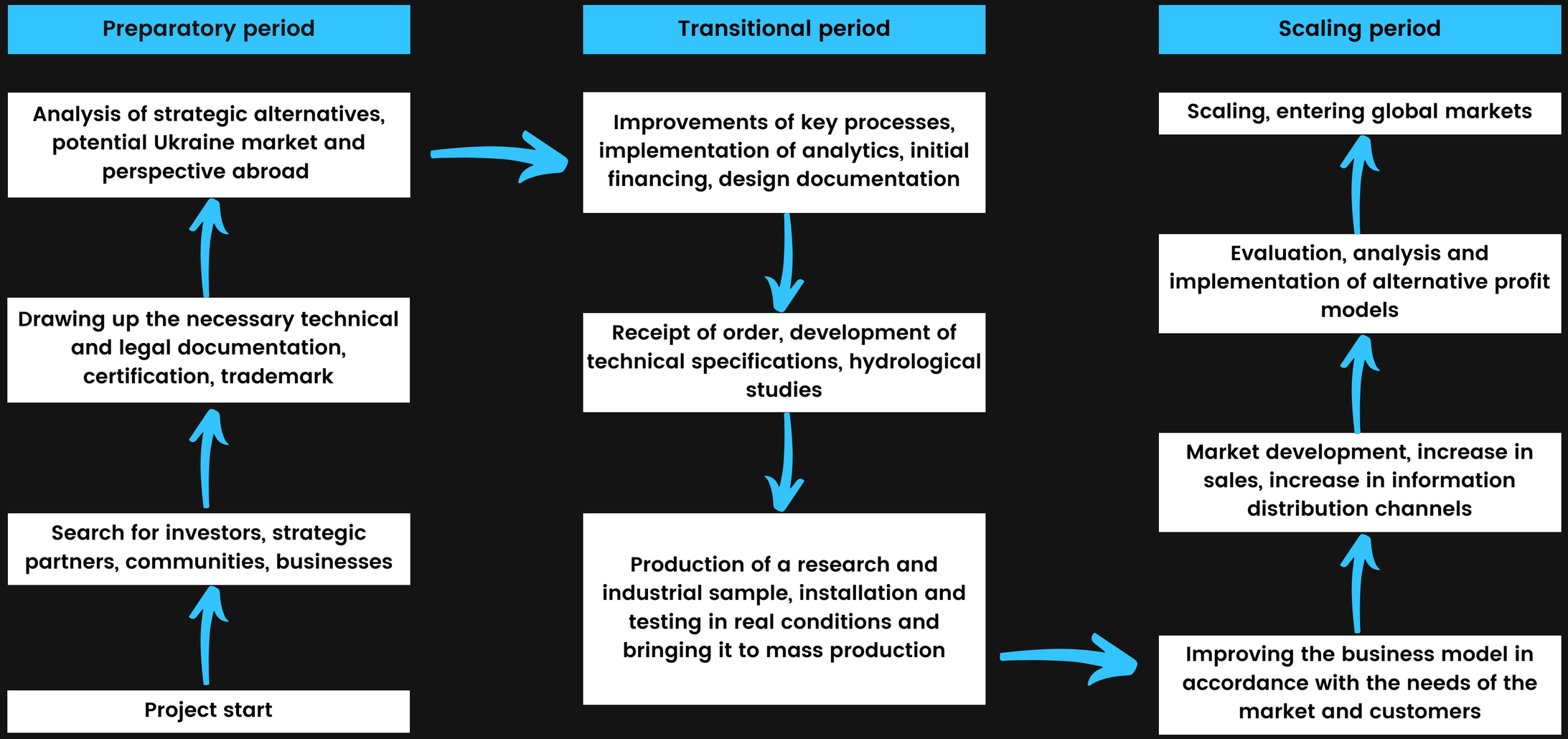
Comparative analysis with a foreign analogue

Comparative characteristics	Analog	DHPP-24
Absolute weight of the unit, (t)	1000-18000	170
Absolute cost of the unit, ($ million)	6-10	2
Absolute unit capacity, (kW)	700-1200	1000
Specific material capacity, (kg/kW)	>1000	170
Specific cost of 1 kW of installed capacity, ($)	>2500	1000
Commercial cost of 1 kWh, (cent $)	>9,0	3,0-5,0
Period of operation, (years)	15	15
Payback period, years	5-10	1-4
State of the working environment	Strong waves (not always)	The flow speed more than 1 m/s (always for selected locations of DHPP)

INVESTMENT PROJECT ESTIMATE

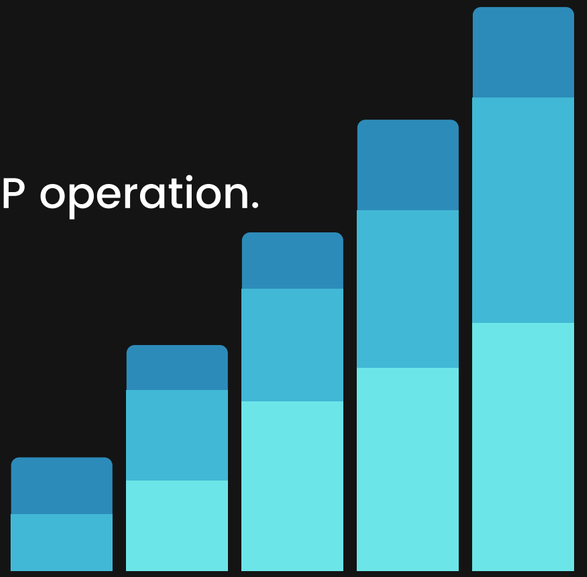
Indicator	Units	Value
Project management (team work during all stages of project implementation, launch, support)	thousand $	800...1000
Hydrological studies of the location of the DHPP installation	thousand $	600...800
Development of technical, design and financial documentation (according to the technical task)	million $	up to 1000
Production of a research and industrial sample of DHPP	million $	3...4*
Installation and testing of DHPP, start-up, commissioning, bringing to working condition	million $	up to 2,0
Documentation, warranty service, related work on electricity generation, transmission and storage	million $	up to 1000
TOTAL AMOUNT "turnkey"	million $	est. 10,0

ROAD MAP OF THE PROJECT



BUSINESS MODEL

manufacture and sale of power plants with individual parameters (turnkey project);
technology sale + royalty;
license sale;
franchise;
development of project and technical documentation by individual order;
project management of the DHPP manufacturing and start-up process;
warranty, post-warranty service;
current service maintenance, installation works;
consulting in the process of DHPP operation;
data processing and development of analytical materials in the process of DHPP operation.



MINING WITH DHPP

ADVANTAGES:

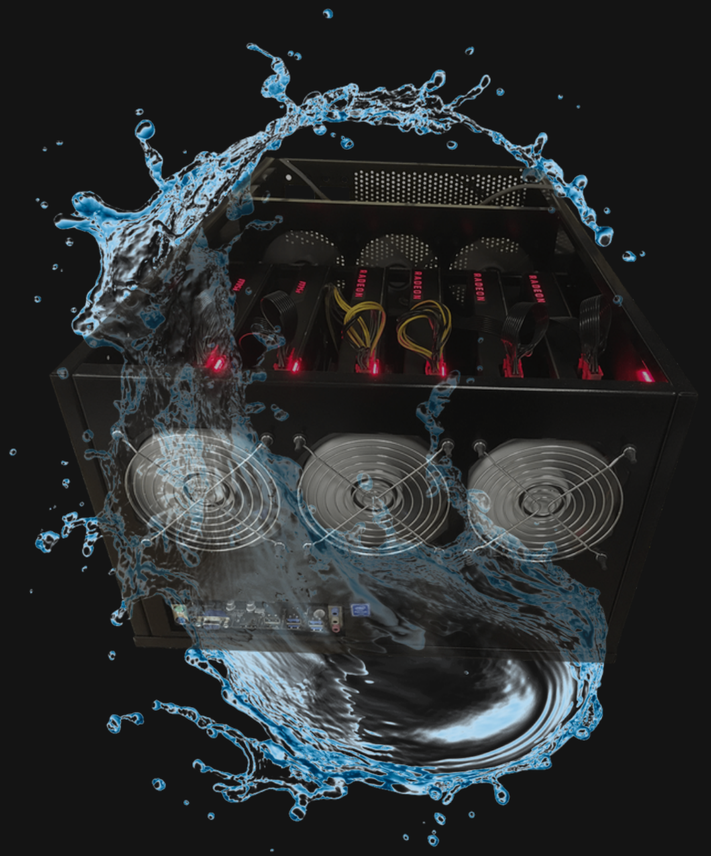
Production of cryptocurrencies with low cost of electric power, approximately 0.03$/kwt

The possibility of cooling the farm with water, which is used for generation.

DHPP turn-key production and the required power

Maintenance and service

Independence from general energy systems



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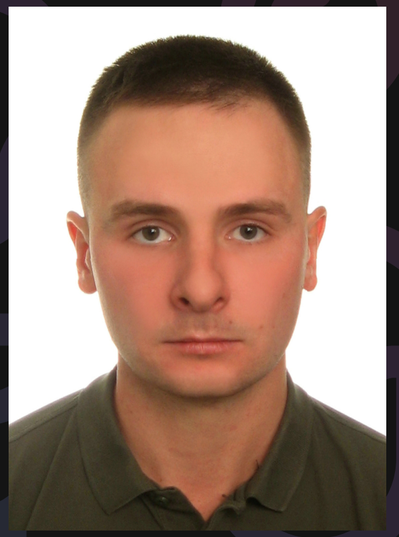

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