Date: 11th June. 2020

To: TECHNOLOGICAL COOPERATION's PARTNERS

TO WHOM IT IS CONCERN

Email:

RE: Wind power systems & New Land Jakarta Project

Storm's Project Jakarta sea wall

Fig.1. Jakarta sea wall

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Storm's Project attentively studies materials on the threat of submersion of a large part of the Indonesian capital Jakarta, and, as always, finds an innovative solution that not only eliminates the threat, but also provides new opportunities for the development of Indonesia. The advantage of Storm's Project technologies can be realized here in the most obvious way.

Fig.1 shows the northern, seaside part of Jakarta, this area almost all has an altitude of no more than 1-2 meters above sea level, that is, leaving this land under the water for 1 meter means the loss of the territory along with the entire infrastructure. As is known, the area of Jakarta is 664 km^2 (including a group of islands Pulau-Seribu). The population is 9'607'787 (2010, census, from Wikipedia), with a population density of 14'469.56 inhabitants per km^2.

We propose to create a wall in the form of a continuous structure that extends for 100 kilometers from the eastern edge of Jakarta to the western edge, and this wall is erected at the bottom of the Bay of Jakarta on the isobath of 5 meters. and rises above the current water level by 5 meters, i.e. has an average height of 10 meters from the bottom.

The length of the wall on its axis is about 100 km. The wall is made using Storm's Project technology and is distinguished by the fact that it requires little material to be delivered from other places - almost the entire material volume of the wall is extracted from the sea bottom. This wall should not rise above the sea an impregnable wall on the whole perimeter. Its shape should be rationalized in the form of a comb of sections protruding into the sea about 800-1000 meters long, about 400-500 meters wide, with the width of the water space in the form of a rectangular bay 500 meters wide and 1000 meters long, in total about 50 hectares each bay. This configuration of the coast protects the coast from storm surges and makes it possible to arrange yacht marinas along the coast, as well as parking lots for floating private houses and tourist hotels on the water.

In the wall at certain intervals it is necessary to arrange stairs that form an exit to the sea, where at the edge of the water you can arrange beautiful beaches at the same time developing them as a tourist area using floating hotels, restaurants and various floating complexes for entertainment.

The total length of such a coastline in the form of a comb may be from 200 to 300 kilometers. The configuration of the wall is chosen in such a way as to preserve as much water space as possible in Jakarta Bay, to leave intact the fish wealth of the Bay, not to deprive fishermen of their livelihoods and at the same time to provide them with convenient parking spaces for their vessels and floating houses where they can live and fish processing.

Our project is at least 4 times cheaper than the known wall project further out to sea with the creation of a closed reservoir between the wall and land, which will require constant pumping of water and huge energy consumption. In addition, this insane $40 billion project will leave fishermen unemployed and Jakarta residents without any fish.

It will be an environmental and humanitarian disaster.

The Storm project is much cheaper, it can be built faster, it includes its own energy supply for construction and leaves behind gigawatts of energy capacity for use in the Indonesian economy, and it is more reliable from all points of view. Indonesia is well positioned to implement Storm's concept on its own, only engineering support and project financing support from Storm's Project will be required.

Return to the technical aspects of the project.

The space of the sea between the wall being erected and the current coastline is filled with soil from the bottom of the sea, which is supplied to this area by dredgers in the form of pulp, with

water going back to the sea, and solid soil remains, and after drying it will become solid ground. What is the volume of soil for such a structure? Let's say the length of the shore is 200 kilometers. The width of the washable land is 1 kilometer on average, that is 200 square kilometers.

The land at the top of the wall should reach the top of this wall to form an embankment at the level of the wall, alleys of trees and shrubs, buildings on the new coastline - the height of the land should be about 5 meters. The average depth of this place is 5 meters. The height of the post of washable land is 10 meters. The average width of the strip is 1000 meters. That is, the total volume of soil is 1 billion cubic meters.
The cost of laying ground in such volumes is about 1 dollar per cubic meter.
This billion cubic meters of ground will give approximately 100 million square meters of solid earth, or 10,000 hectares. If we take the value of the land in Jakarta as $1 million per hectare ($100 per square meter), the total value of this new land could be $10 billion.

At the same time, the cost of building this wall and washing the land as a whole is about $5 billion. It is clear that such a project cannot be realized in a year or two, but in 5 or 10 years it is quite real.

Given the possibility of a systematic creation of such land with its implementation both on the fact of appearance, and as a futures, you can reduce to a reasonable amount of diversion of funds for all stages of construction - up to 2 billion dollars for 5 years.

Energy supply for the project

Projects to create solid ground from the seabed require high energy costs. For Jakarta, given the shallowness of the bay (average depth of 5 meters) and the design height of the land being created (5 meters), the average height of the ground elevation from the sea bottom can be

considered as 5 meters. The Dredger Rise Rate is 4, which will include energy for pumping water from the dried area beyond the coastline to be created.

Let us estimate the area of land to be created (Fig.2).

The total area of the area New land of Jakarta is 200 sq.km = 2000000 sq.m.

The total volume of soil is 1 billion cubic meters. This work will require approximately 63,000 GWh of electricity to drive the dredgers.

Such energy in the wind conditions of Jakarta Bay can be produced by a wind turbine system with a total capacity of 2 GW by the completion of construction, taking into account a design period of 8-10 years. For the purposes of the project it is rational to use the Vestas V150 horizontal wind turbines with capacity of 4 MW, mastered by the industry and produced in series, and in the future, approximately since 2028, the original VAWT turbines Storm VAWT-20MW with capacity of 20 MW.

The implementation of the project for the introduction of 500 MW of wind power capacity of the 1st stage will take approximately 4-5 years, the next 1,500 MW of the 2nd stage will take approximately 4 more years, with the introduction by years:

Table of input of wind power turbines by years

Year	Power input, MW	Input of turbines, units	General power, MW	All turbines, units	Notes
2021	80	20	80	20	Vestas V150 - 20
2022	120	30	200	50	Vestas V150 - 50
2023	160	40	360	90	Vestas V150 - 90
2024	140 100	35 5	500 600	125 130	Vestas V150 - 125 Storm VAWT-20MW - 5
2025	500	25	1100	155	Storm VAWT-20MW - 30
2026	500	25	1600	180	Storm VAWT-20MW - 55
2027	400	20	2000	200	Storm VAWT-20MW - 75
2028	-	-	2000 500 1500	200 125 75	Project Completion Vestas V150 - 125 Storm VAWT-20MW - 75

Fig 2. New Land Jakarta 200 sq.km

The result will be an additional 200 square kilometers of land for Jakarta and 2 GW of wind power.

The energy component of the project will cost an additional $2.3 billion dollars...

The estimated cost of the 10-year construction part of the project is $10 billion dollars.

It is reasonable to supplement the project with a fresh water supply system using Storm technology, on the basis of approximately $1,000 per person, for the population of New Land of Jakarta 2 million people - $2 billion.

Summary table of expenditure and income (provisional)

Expenses	Year of beginning	Year of completion	Amount
Planning	2020	2021	$40,000,000.00
Designing (R&D)	2020	2030	$400,000,000.00
Power Base 2 GW	2021	2028	$2,000,000,000.00
Construction of Wall and Land	2020	2030	$10,000,000,000.00
Construction of infrastructure and water supply system,	2021	2030	$2,000,000,000.00
Planning works, housing, population	2021	2030	$2,000,000,000.00
Total expenditure	2020	2030	$16,440,000,000.00 (US$16,44 billion)
Revenues	2025	2070	
Sale of land	2021	2070	$20,000,000,000.00 ($100,000,000.00/sq.km)
Services of ports and marinas	2021	2070	$10,000,000,000.00
Leasing	2021	2070	$10,000,000,000.00 (realty etc.)
Total income	**2021**	**2070**	**$70,000,000,000.00 US$70 billion (for 49 years)**

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