

Ports Energy and Carbon Savings

Deliverable 3.11.2

Report about the identification of most suitable sites in the ports of Oostende and Hellevoetsluis.

Project No. 2S03-009



With the financial support of



Author

NAME [USE TABLE-TITLE]	ORGANISATION [USE TABLE-TITLE]
Ing. Timmerman Yvon	BPS

Revision history

REVISION	DATE	AUTHOR	ORGANISATION	DESCRIPTION
	16/10/2018	YT	BPS	Original

Table of contents

1. Introduction 4

2. Port of Ostend 4

2.1. Location 1: Front harbor. New Eastern jetty 4

2.2. Location 2: Front harbor. “Small beach” 5

2.3. Location 3: Middle harbor. Port office building on land or at quayside 6

2.4. Location 4: Middle harbor. Tijdsdok. Second location of test-rotor 6

2.5. Location 5: Middle harbor. End of Zeewezendok. First location of test-rotor 7

2.6. Location 6: Aft harbor 7

2.7. Location 7: Outside harbor 8

2.8. Location 8: Vismijnlaan 1, Construction site 8

2.9. Wind: 9

2.10. Solar: 9

2.11. Wave & tidal: 10

2.12. Conclusions: 10

3. Marina of Hellevoetsluis 11

3.1. Location 1: Outside Helius Port 12

3.2. Location 2: Inside Helius Port 12

3.3. Location 3: Outside Hellevoetsluis beach 13

3.4. Location 4: Wittens Hoeck & De struyten waterfront 13

3.5. Location 5: Outside Tramhaven 14

3.6. Location 6: Outside zuidfront 14

3.7. Wind: 15

3.8. Solar: 15

3.9. Wave & tidal: 16

3.10. Conclusions: 16

1. Introduction

Identification of most suitable sites in the ports of Ostend & Hellevoetsluis for installation of pontoon. A list follows of sites and the observations or remarks

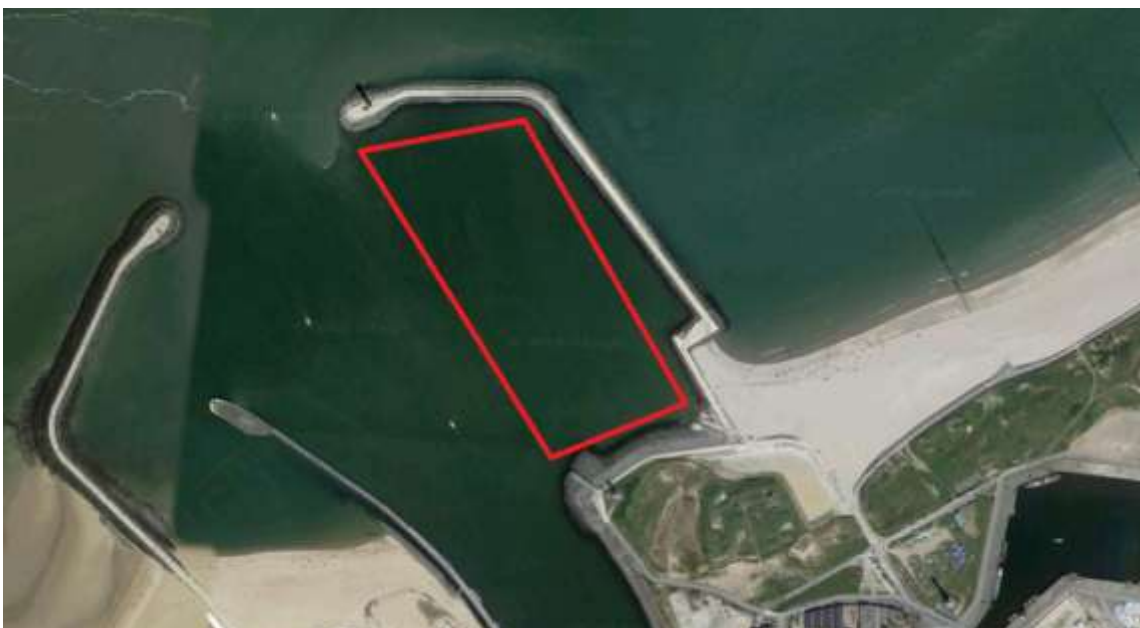
2. Port of Ostend



Situated in Europe's busiest maritime area, the Port of Ostend is a versatile short sea port, accommodating all types of coastal maritime traffic.

<https://www.portofoostende.be/about>

2.1. Location 1: Front harbor. New Eastern jetty.



Prime location.

Best wind location.

Depth charts studied at Port building showed depths between 2m to 0

Very good location for exposure to public.

Possibilities to make events for public entertainment.

Permission available directly from harbor control/ master when terminal not in commercial operation. No permits needed.

2.2. Location 2: Front harbor. "Small beach".



Prime location.

Good wind location.

Depth charts studied at Port building showed depths between 3m to 0

Best location for exposure to public.

Possibilities to make events for public entertainment.

Pontoon could be used by rescue services as mooring base while over watching busy beach.

City council expressed safety concerns for swimmers. However, no real dangers apply and fencing of the unit can easily be achieved.

Permit required from coastal department due to tourism activities close by.

2.3. Location 3: Middle harbor. Port office building on land or at quayside.



Good location.

Good wind exposure.

Good location for exposure to public, foreign officials and businessmen visiting port.

Possibilities to make events for public entertainment.

Permission available directly from harbor control/ master when terminal not in commercial operation. No permits needed.

2.4. Location 4: Middle harbor. Tijdsdok. Second location of test-rotor.



Suitable location.

Good wind exposure from North through West to South winds. 180° other winds are broken by buildings East of location.

Permission available directly from harbor control/ master when terminal not in commercial operation. No permits needed.

2.5. Location 5: Middle harbor. End of Zeewezendok. First location of test-rotor.



Good location.

Good wind exposure 360°.

Permission available directly from harbor control/ master when terminal not in commercial operation on needed site. No permits needed.

2.6. Location 6: Aft harbor.



Suitable location.

Good wind exposure expected.

Proximity to Greenbridge

Good location for exposure to public, foreign officials and businessmen visiting port & Greenbridge.

Possibilities to make events for public entertainment.

Permission available directly from harbor control/ master when terminal not in commercial operation on needed site. No permits needed.

2.7. Location 7: Outside harbor.



Prime location.

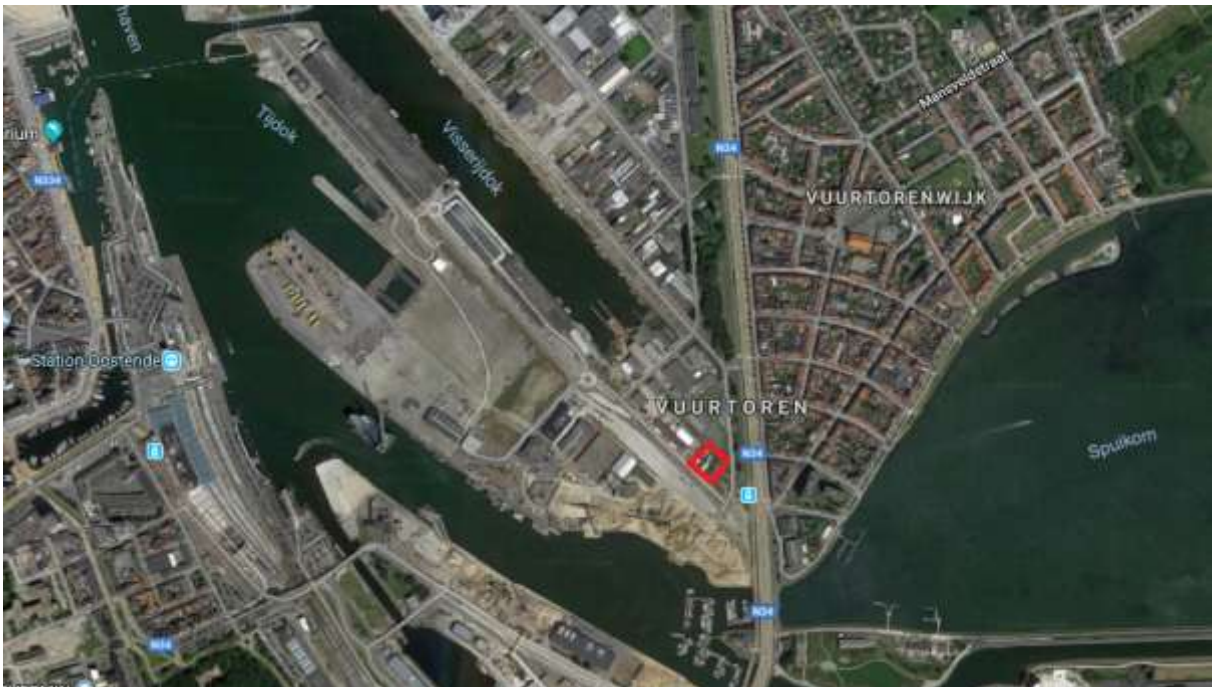
Best wind location.

Shipping traffic must be considered.

Permission required from Federal agency as well as port authorities.

Challenging conditions for weather as unit would have the full force of storms in Autumn & Winter.

2.8. Location 8: Vismijnlaan 1, Construction site.



Construction site.

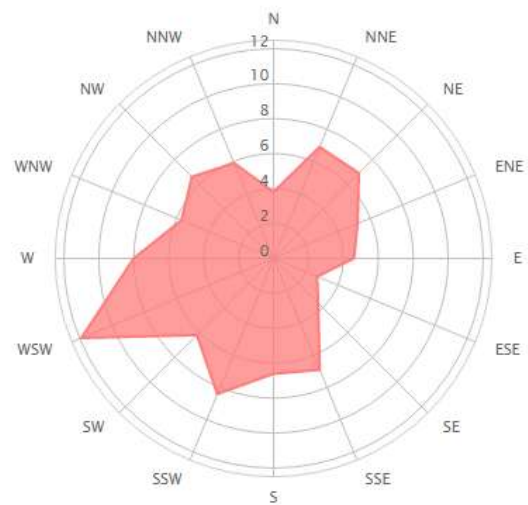
Pre-mounting location

Pre-testing location of system

2.9. Wind:



Verdeling van de windrichting in %

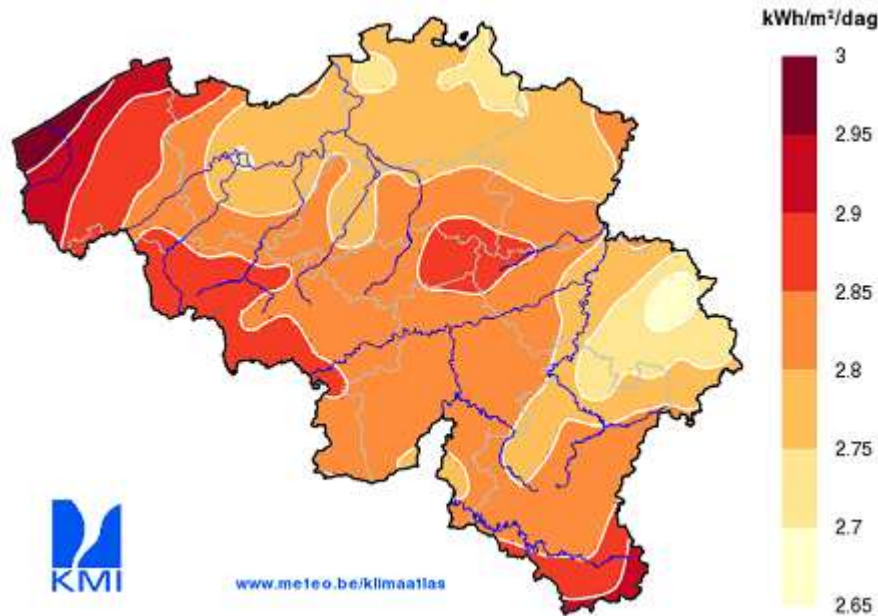


2.10. Solar:

Klimaat Oostende - België

Temperatuur - Neerslag - Zonneschijn

	°C °F					
	Jan	Feb	Maa	Apr	Mei	Jun
Max. temperatuur in °C	4	6	8	11	15	18
Min. temperatuur in °C	1	1	2	5	8	11
Neerslag in mm	52	44	28	31	32	32
Dagen met neerslag	14	13	10	10	9	9
Uren zon	60	75	145	195	230	230
	Jul	Aug	Sep	Okt	Nov	Dec
Max. temperatuur in °C	19	19	19	15	10	6
Min. temperatuur in °C	13	13	11	8	4	2
Neerslag in mm	61	56	58	74	60	51
Dagen met neerslag	12	13	10	14	14	10
Uren zon	220	205	170	120	65	45



2.11. Wave & tidal:

Wave & tidal climate inside the port are not high enough at this point to engage a commercially feasible ad-on. This will be studied further during the project as new options could be realized.

2.12. Conclusions:

After a lot of meetings with Port authorities, studies of locations data and charts. location 1 was best suited but due to works in ports not available until 2020 or later.

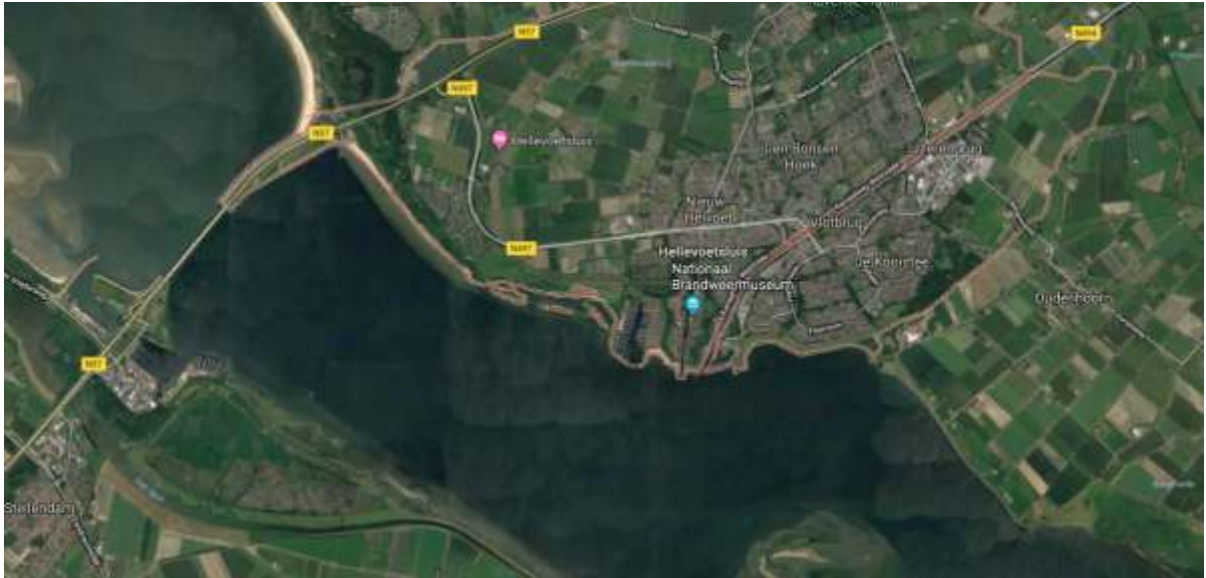
Location 7 is considered too challenging for current testing conditions, however interesting as future location.

Therefore, permit request for location 2 has been submitted to the coastal department agency on 10/07/2018.

Update: On 13/08/2018 permission was granted to place pontoon with main restriction: Placement outside of tourist season.

The location is therefore being reconsidered as this has effects on the planning. Possibility is to use one of the other locations where no permits are required to keep project planning in good control.

3. Marina of Hellevoetsluis

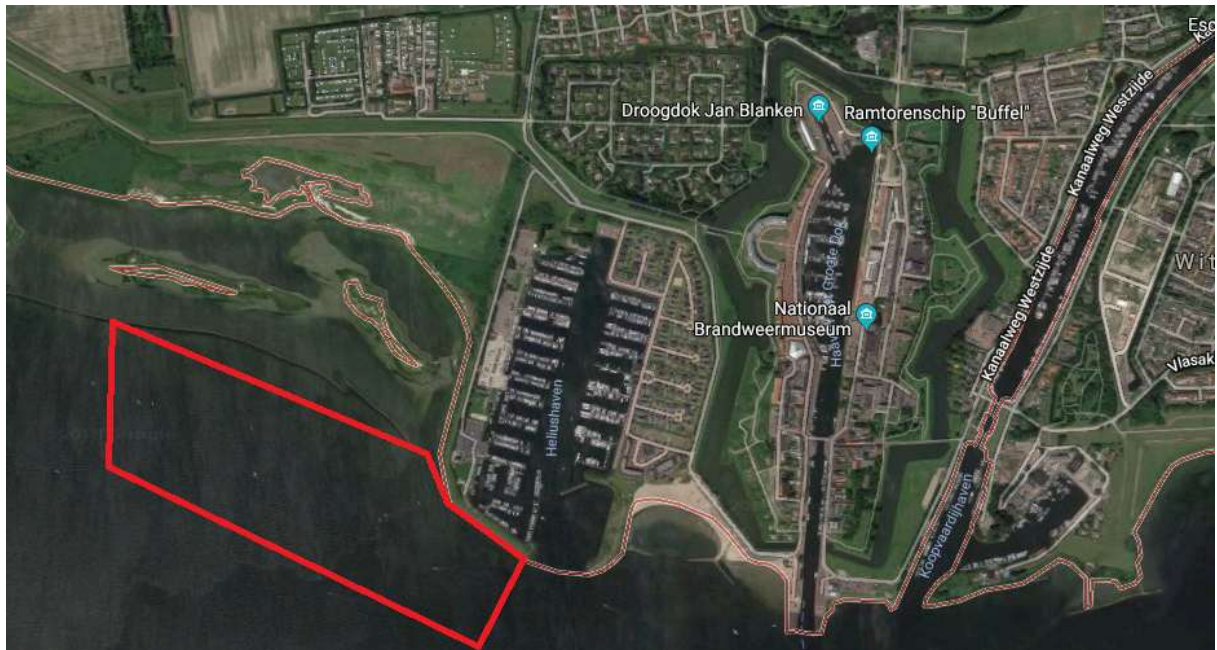


Hellevoetsluis is mainly a Jachting marina and has six beautiful harbors with a total of 2000 berths. The harbors offer a wonderful base for water sports enthusiasts who love the wide water of the Haringvliet and the sea. From Hellevoetsluis it is possible to enter the Zeeland and South Holland Delta, both through the inland waters and the sea.

<http://www.marinahellevoetsluis.nl/>

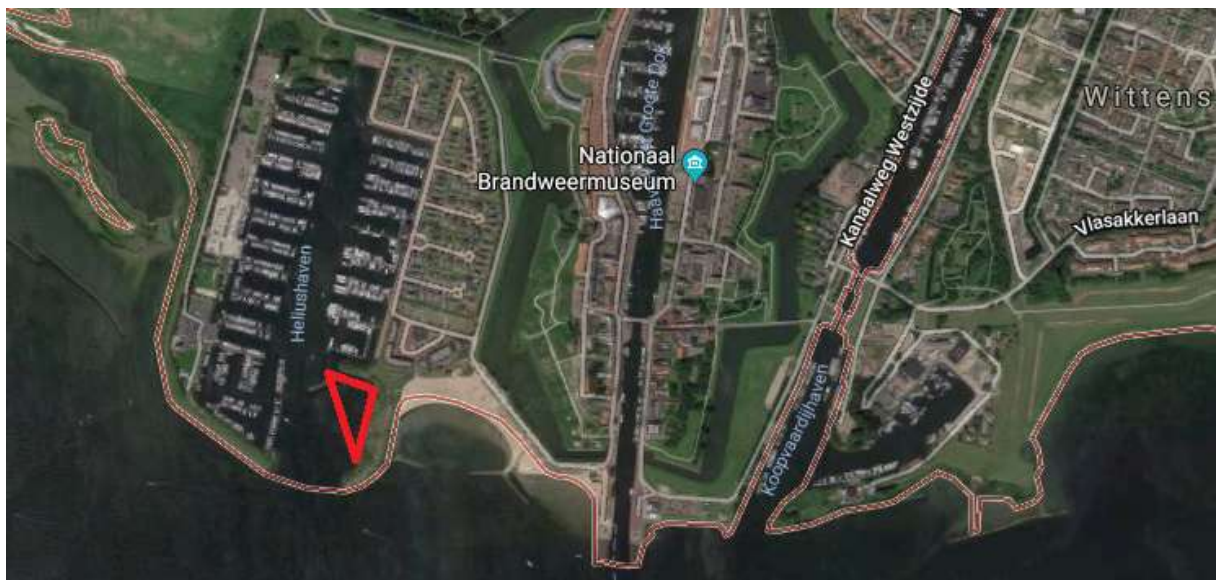
<https://jachthavenhellevoetsluis.nl/>

3.1. Location 1: Outside Helius Port



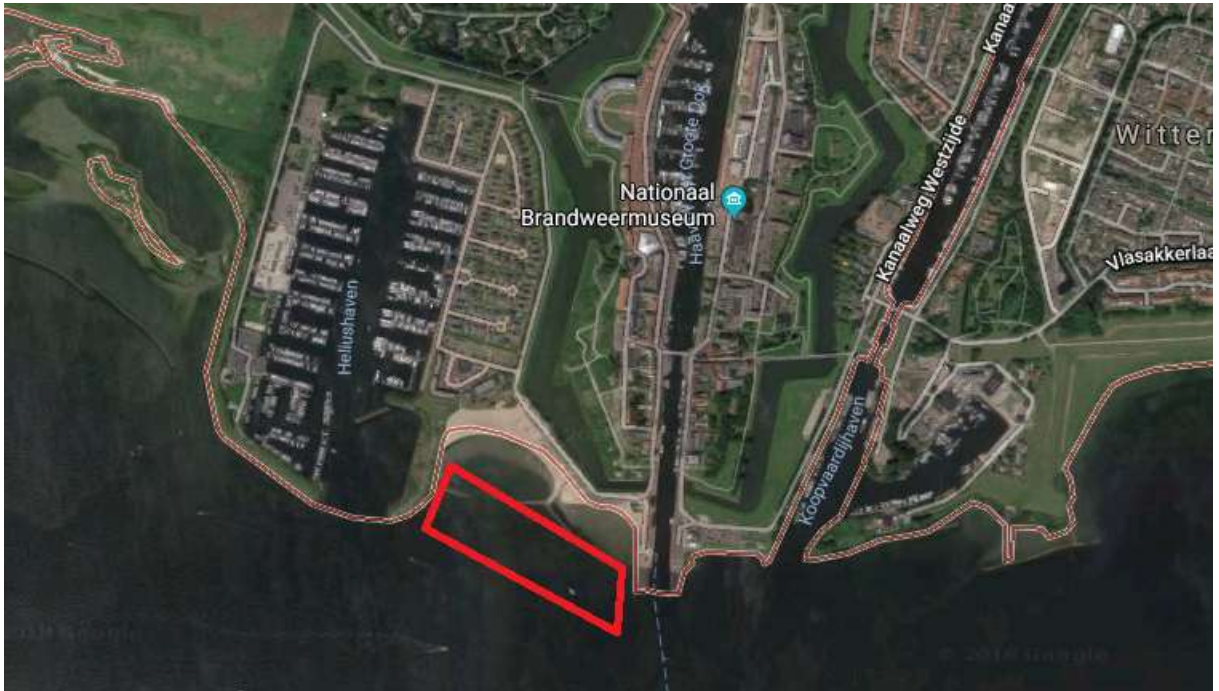
Prime location.
Best Wind location.
Permits required from Provincial Level, rijkswaterstaat.
Close to reserve.
Depths acceptable

3.2. Location 2: Inside Helius Port



Good location.
Good Wind location. A little sheltered.
Permission only through Harbourmasters and local clubs. No Permits.
Preferred location by stakeholders of Helius marina & Hellevoetsluis PECS partner to have secondary effect of harbor protection from pontoon unit.
Demonstrative location to also showcase the harbor & coastal protective nature of the unit and thus secondary benefits.

3.3. Location 3: Outside Hellevoetsluis beach



Prime location.

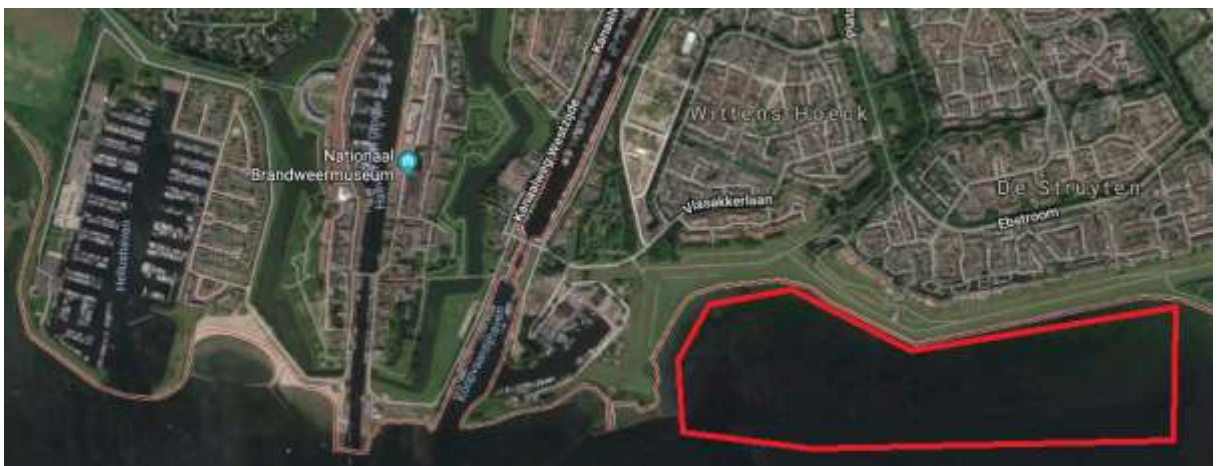
Best Wind location.

Permits required from Provincial Level, rijkswaterstaat. Permission required of city.

Close to public beach.

Depths acceptable

3.4. Location 4: Wittens Hoeck & De struyten waterfront



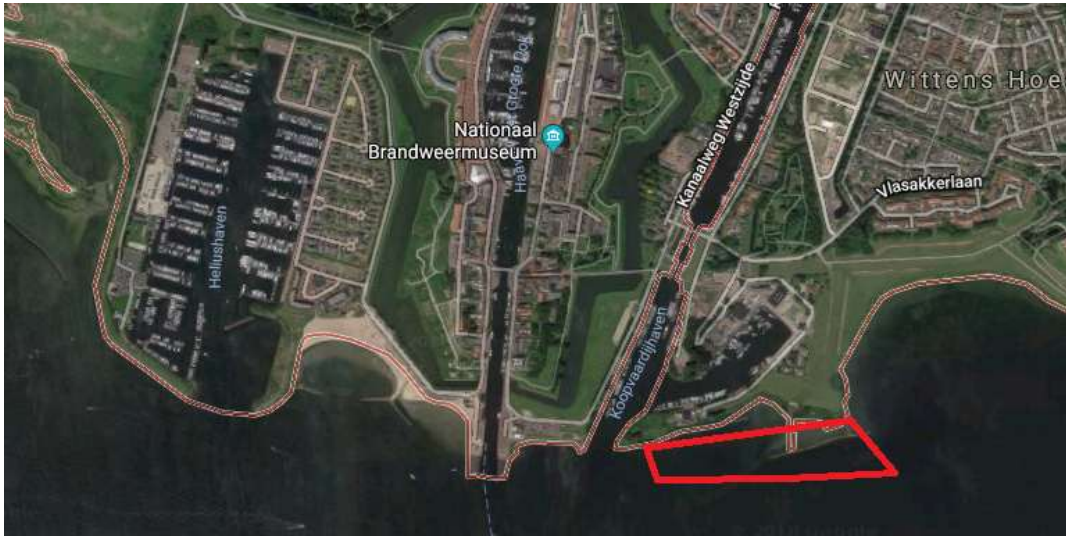
Prime location.

Best Wind location.

Permits required from Provincial Level, rijkswaterstaat. Permission required of city.

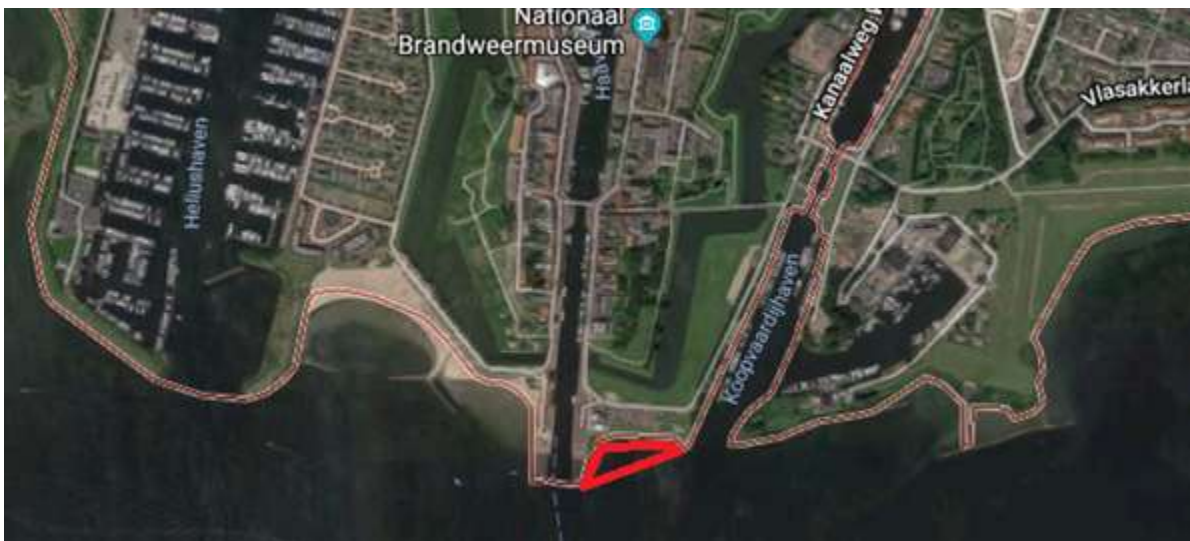
Depths acceptable

3.5. Location 5: Outside Tramhaven



Prime location.
Best Wind location.
Permits required from Provincial Level, rijkswaterstaat. Permission required of city.
Depths acceptable

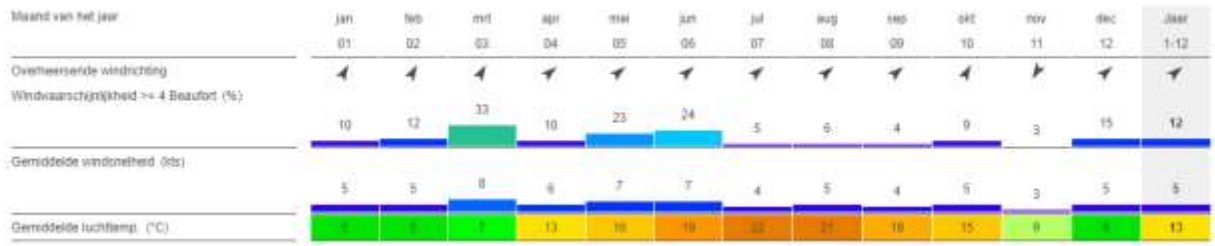
3.6. Location 6: Outside zuidfront



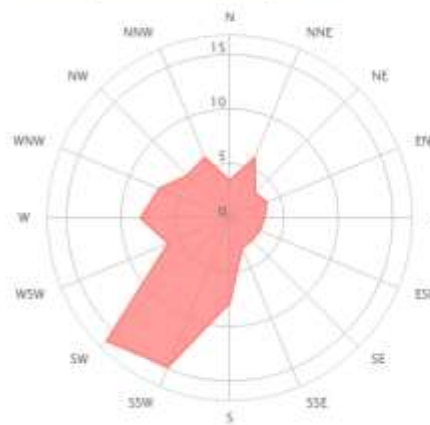
Prime location.
Best Wind location.
Near Shipping traffic. To be furtherdiscussed
Permits required from Provincial Level, rijkswaterstaat. Permission required of city.
Depths acceptable

More locations might be studied in future.

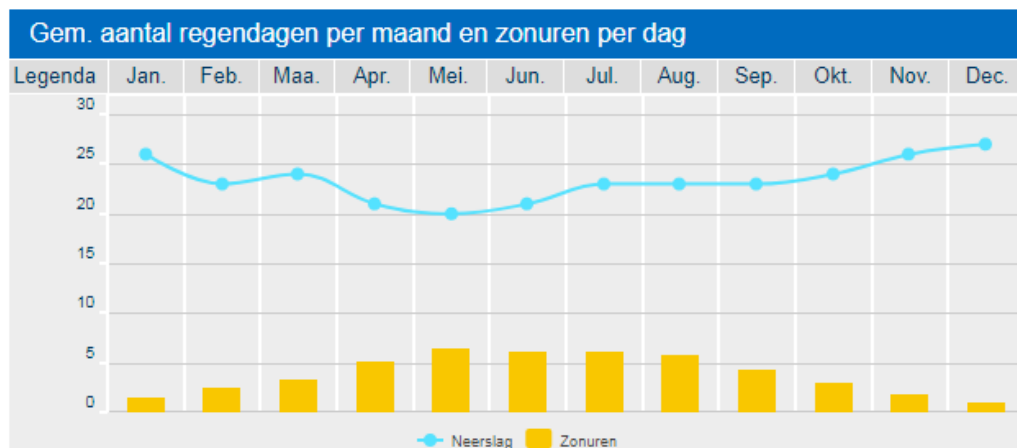
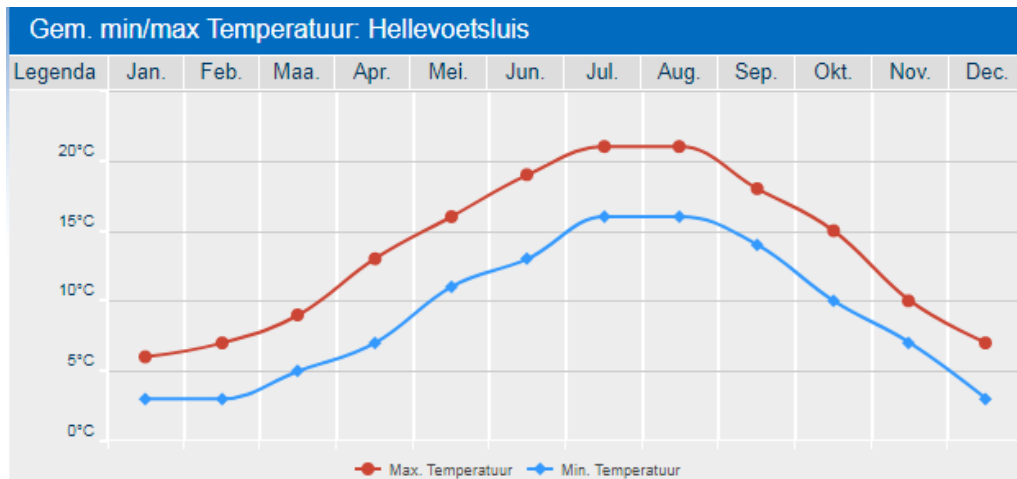
3.7. Wind:

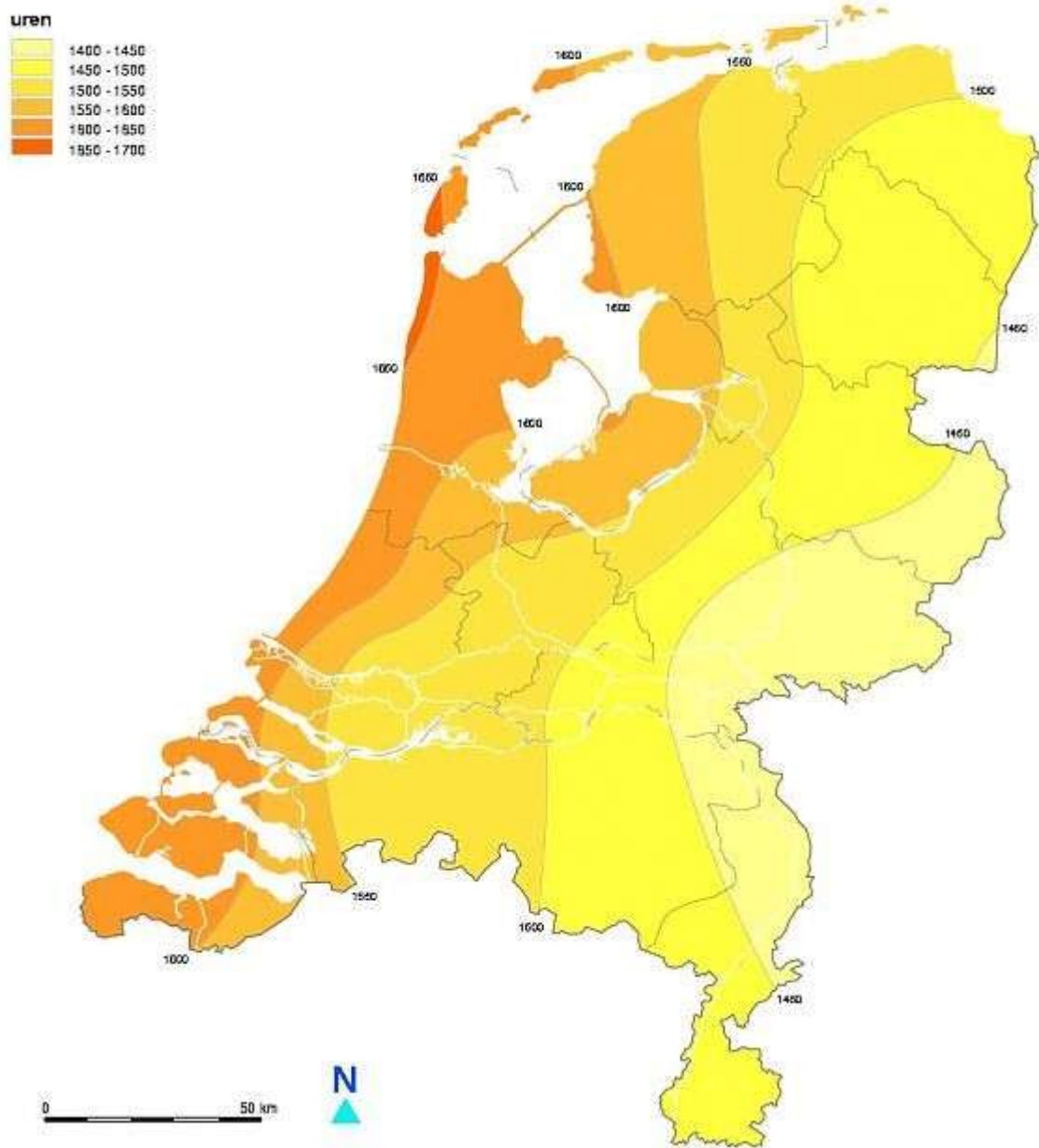


Verdeling van de windrichting in %



3.8. Solar:





3.9. Wave & tidal:

Wave & tidal climate inside & outside the port are not high enough at this point to engage a commercially feasible ad-on. This will be studied further during the project as new options could be realized.

3.10. Conclusions:

Best location would be at location 1 or 2 due to possibilities of connections. Location 2 has been favored by Hellevoetsluis as Helius stakeholders prefer the location to benefit from the unit's secondary sheltering effect. No permits would be required.