The European offshore wind industry

Key trends and statistics 1st half 2018

WindEurope

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Published July 2018

WindEurope

windeurope.org

This report summarises construction and financing activity in European offshore wind farms from 1 January to 30 June 2018.

WindEurope regularly surveys the industry to determine the level of installations of foundations and turbines, and the subsequent despatch of first power to the grid. Data includes demonstration sites and factors in decommissioning when they occur, representing net installations per site and country unless otherwise stated.

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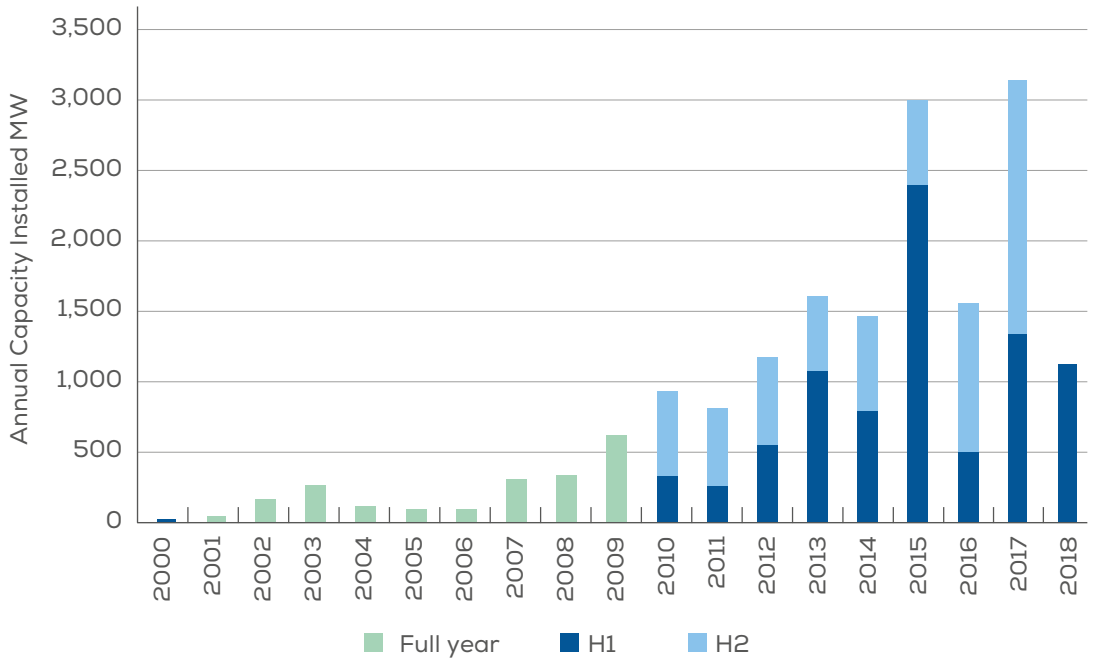
EXECUTIVE SUMMARY

In the first six months of 2018, Europe fully grid connected 200 commercial offshore wind turbines with a combined capacity totalling 1,120 MW. Overall, 16 commercial wind farms and two demonstration projects, including a floating project, saw activity in H1 2018. Once completed they will have a total capacity of over 7.7 GW.

FIGURE 1

Annual installed offshore wind capacity in Europe (MW)



Source: WindEurope

New offshore capacity installations during the first half of 2018 were down 16% compared to the same period the previous year. The work carried out in European wind farms during the first six months of 2018 is detailed below:

- 200 wind turbines were fully grid connected, totalling 1,120 MW in nine wind farms: Rampion (UK), Walney 3 (extension phase 1 – West) (UK), Walney 3 (extension phase 2 – East) (UK), Galloper (UK), Race Bank (UK), Nissum Bredning (DK), Rentel (BE), Elisa (ES) and Eolink prototype (FR).
- 149 turbines (96 units or 40% less than during the same period last year) were erected in eight wind farms in the first half of the year: Walney 3 (extension phase 2 – East) (UK), Aberdeen Bay (EOWDC) (UK), Borkum Riffgrund II (DE), Merkur (DE), Nissum Bredning (DK), Rentel (BE), Elisa (ES) and Eolink prototype (FR). Some have been grid-connected, some have not.
- Including installation activity from last year, 70 turbines, totalling 530 MW, are currently erected but awaiting grid connection.
- 213 foundations (13% more than the same period last year) were installed in 10 wind farms: Aberdeen Bay (EOWDC) (UK), East Anglia 1 (UK), Beatrice 2 (UK), Hornsea 1 (UK), Hohe See (DE), Trianel Windpark Borkum 2 (DE), Horns Rev 3 (DE), Borkum Riffgrund II (DE), Elisa (ES) and Eolink prototype (FR). Activities at Albatros (DE) commenced in the first half of 2018, but as of 30 June no foundations were installed.
- The average size of wind turbines installed in the first half of 2018 is 5.6 MW, or 3% lower than over the same period last year.

As of 30 June 2018, cumulatively, there are 4,349 offshore wind turbines with a combined capacity of 16,880 MW grid connected in European waters in 98 wind farms across 11 countries, including demonstration sites and projects not fully grid connected.

1

TURBINES GRID-CONNECTED

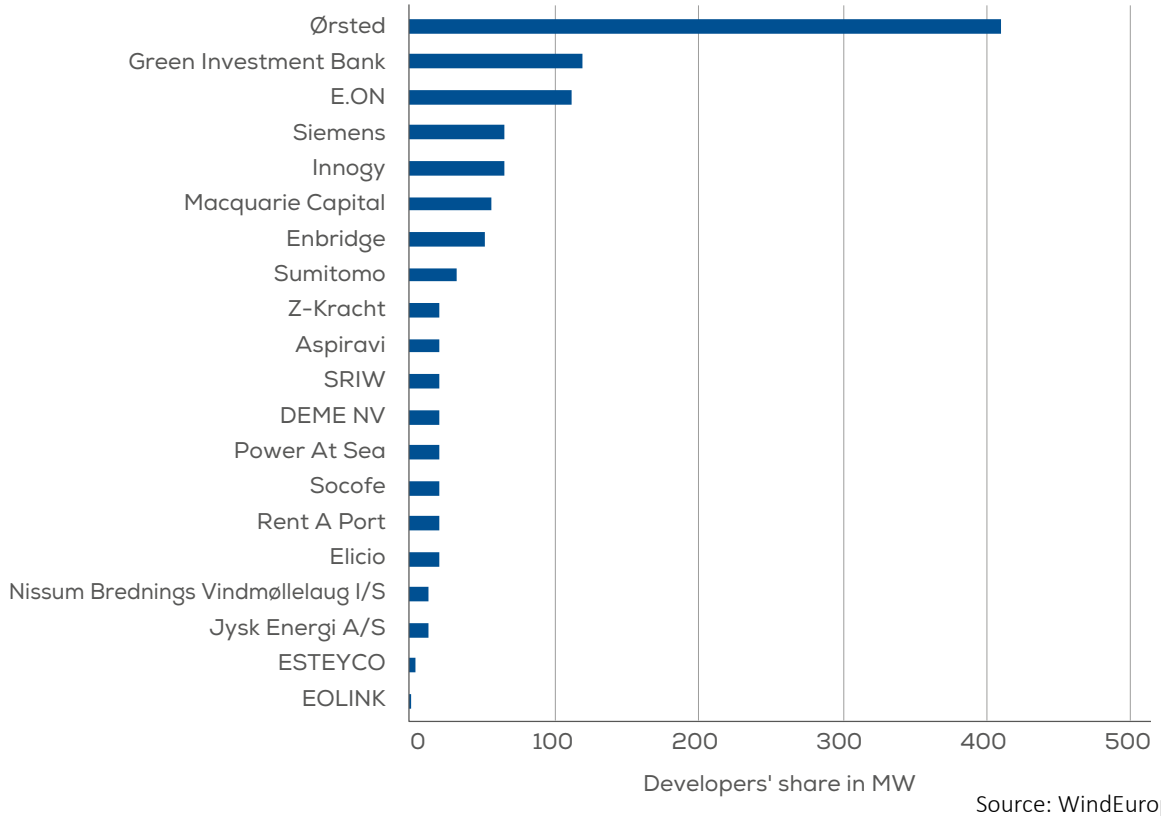
1.1 OWNERSHIP

Nine commercial wind farms connected wind turbines to the grid totalling 1,120 MW. Figure 2 shows the share of connected MW per developer from 1 January to 30 June 2018 taking into account each company's share in the projects.

There are multiple owners at sites with grid connections. Power producers still account for the majority share. Similarly as 2017, infrastructure and pension funds account for a good share of the installed capacity.

FIGURE 2

Offshore wind developers' share of new grid connected capacity between 1 January and 30 June 2018 (MW)



Source: WindEurope

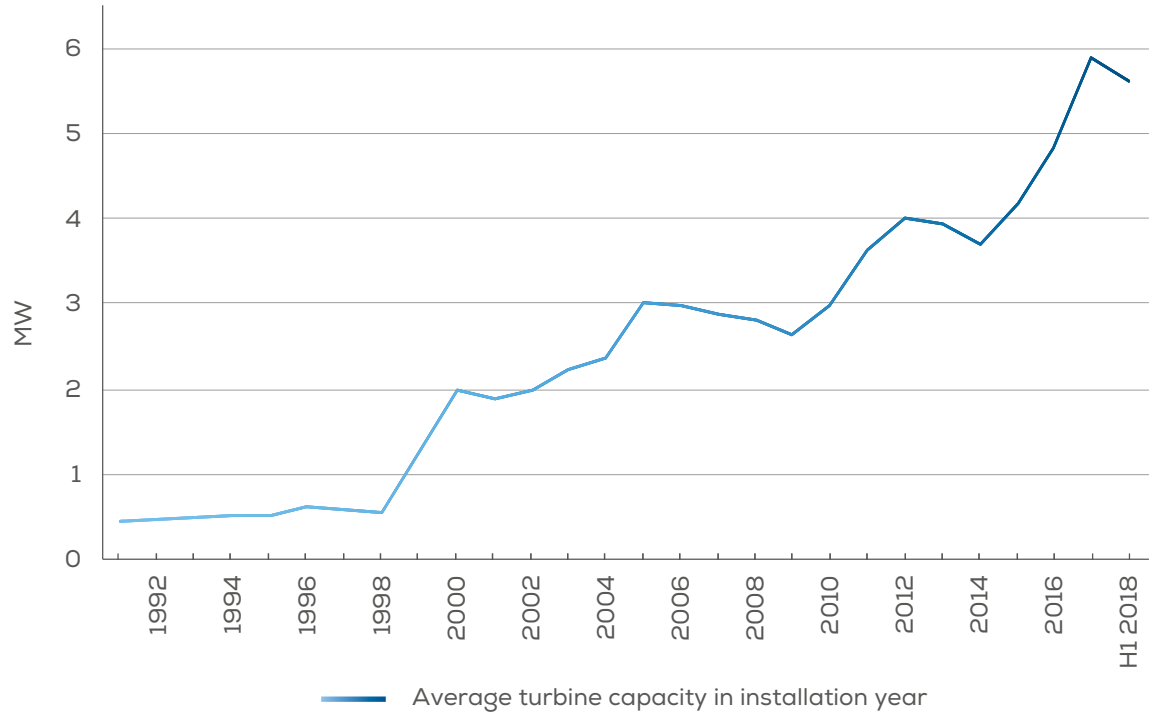
1.2 WIND TURBINES

Siemens Gamesa provided 74% of the turbines grid-connected in the first half of 2018. MHI Vestas provided 25%. Adwen and Eolink provided the two remaining connected turbines. If we exclude Eolink, a floating demonstration project, connected turbines ranged in size between 3.45 MW and 8.8 MW.

The average wind turbine installed during the first six months of the year is 5.6 MW, representing a 3% decrease over the same period last year. Only one out of the 18 sites under construction in 2018 use 3 MW class turbines. One site is using 5 MW turbines, four sites are using 6 MW class turbines, eight sites are using 7 MW turbines and four sites are using 8 MW turbines. Aberdeen Bay has installed two 8.8 MW turbines, which are the most powerful wind turbines installed in a wind farm as of 30 June.

FIGURE 3

Average rated capacity of turbines installed



Source: WindEurope

2

CONSTRUCTION CARRIED OUT

2.1 SUMMARY

During the first six months of the year work was carried out on 18 offshore wind farms. Foundations and turbines were installed and/or grid connected in 6 countries: Belgium, Denmark, France, Germany, Spain and the United Kingdom.

TABLE 1

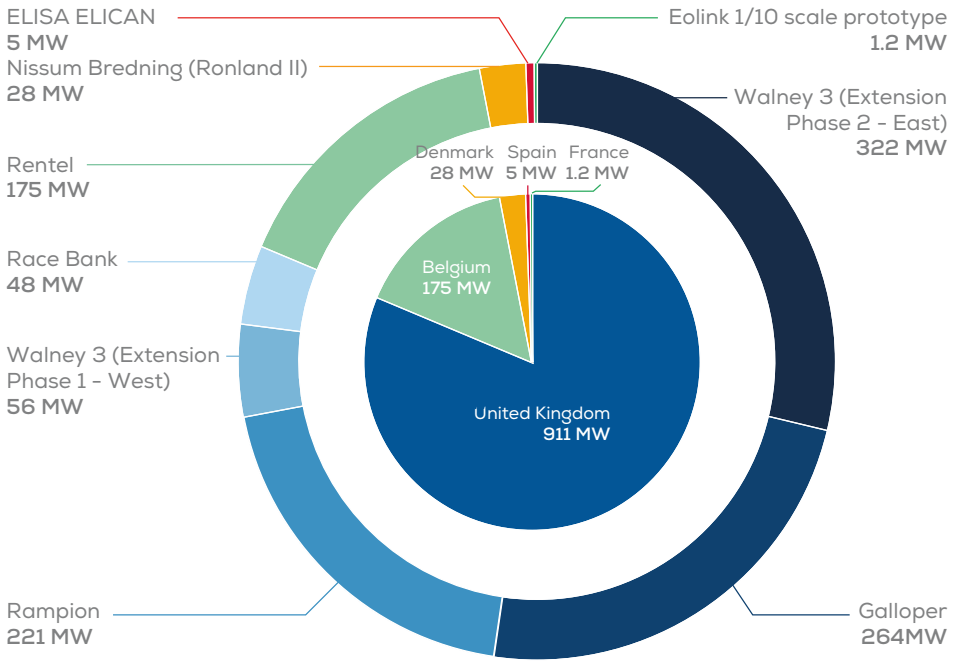
Summary of work in offshore wind farms between 1 January and 30 June 2018

	NUMBER OF FARMS	NUMBER OF FOUNDATIONS INSTALLED	NUMBER OF TURBINES ERECTED	NUMBER OF TURBINES GRID CONNECTED	MW FULLY CONNECTED TO THE GRID
BELGIUM	1	0	25	25	175
DENMARK	2	2	2	4	28
FRANCE	1	1	1	1	1.2
GERMANY	4	75	62	0	0
SPAIN	1	1	1	1	5
UNITED KINGDOM	9	134	58	169	911
TOTAL	18	213	149	200	1,120

Source: WindEurope

FIGURE 4

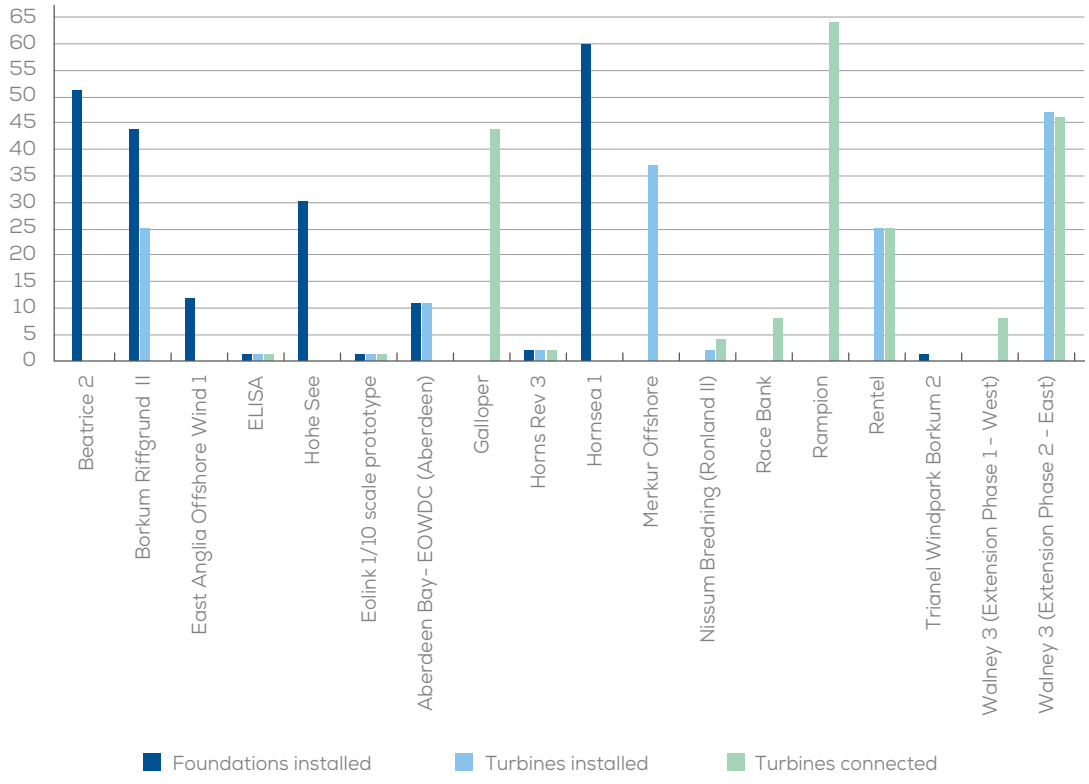
Summary of work in offshore wind farms between 1 January and 30 June 2018



Source: WindEurope

FIGURE 5

Installation of wind turbines in offshore wind farms between 1 January and 30 June 2018



Source: WindEurope

2.2 OFFSHORE WIND INSTALLATIONS

7 out of 18 projects with construction activity are new starts in 2018, representing 3 GW of additional capacity upon their completion. As of 30 June, the status of projects with construction activity is as follows:

TABLE 1

Summary of work in offshore wind farms between 1 January and 30 June 2018

WIND FARM NAME	COUNTRY	STATUS
Aberdeen Bay	UNITED KINGDOM	Turbines erected
Beatrice 2	UNITED KINGDOM	Foundations installed
Borkum Riffgrund II	GERMANY	Foundations partially installed
East Anglia Offshore Wind 1	UNITED KINGDOM	Foundations partially installed
ELISA ELICAN	SPAIN	Fully grid connected
Eolink 1/10 scale prototype	FRANCE	Fully grid connected
Galloper	UNITED KINGDOM	Fully grid connected
Hohe See	GERMANY	Foundations partially installed
Horns Rev 3	DENMARK	Foundations installed
Hornsea 1	UNITED KINGDOM	Foundations partially installed
Merkur Offshore (formerly MEG 1)	GERMANY	Turbines partially erected
Nissum Bredning (Ronland II)	DENMARK	Fully grid connected
Race Bank	UNITED KINGDOM	Fully grid connected
Rampion	UNITED KINGDOM	Fully grid connected
Rentel	BELGIUM	Partially grid connected
Trianel Windpark Borkum 2	GERMANY	Foundations partially installed
Walney 3 (Extension Phase 1 - West)	UNITED KINGDOM	Partially grid connected
Walney 3 (Extension Phase 2 - East)	UNITED KINGDOM	Partially grid connected

Source: WindEurope

- Activities at OWP Albatros (DE) commenced in the first half of 2018, but as of 30 June no foundations were installed, so the project is not included in this report

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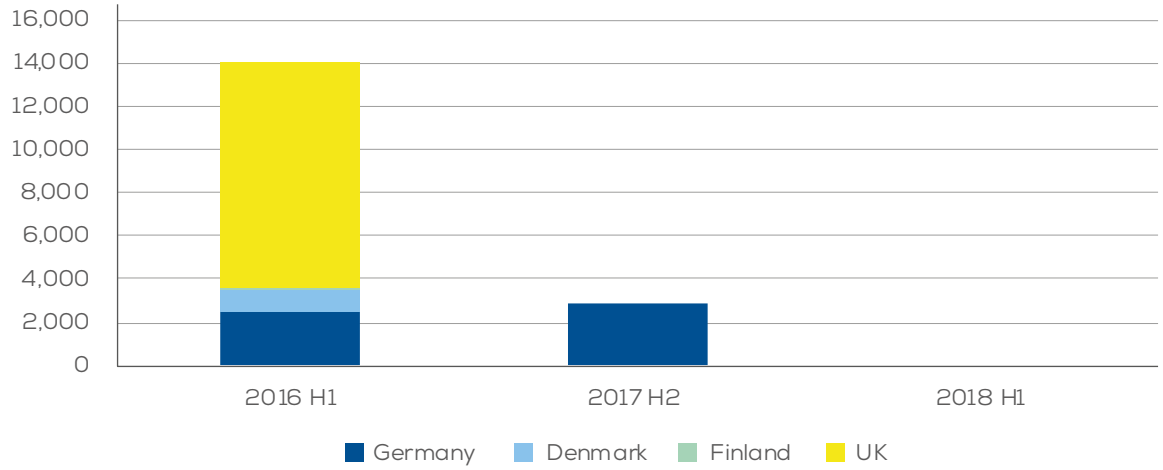
FINANCING TRENDS

In the first half of 2018 there have been no final investment decisions in offshore wind farms in Europe. This contrast to previous half years when a handful of projects saw firm decisions on financing new wind farms.

We expect a number of FID being materialised later this year or early 2019, including projects in Belgium, such as Northwester 2 (224 MW), the UK with the Triton Knoll Wind Farm (860 MW) and in Germany with the Gold wind III (110 MW).

FIGURE 6

Total investment in new offshore generation assets (M€)

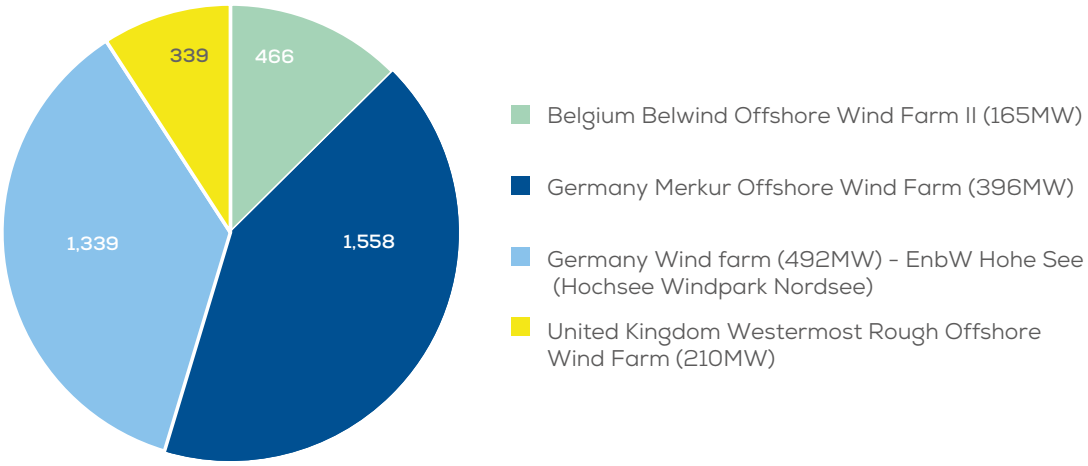


Source: WindEurope

While no investments were dedicated to new assets, the first half of 2018 saw 3.7bn€ in refinancing transactions; 15% higher than in the first half of 2017.

FIGURE 7

Refinancing of offshore wind farms in 2018 H1



Source: WindEurope

3.1 OUTLOOK FOR H2 2018 AND 2019

TABLE 3

Short-term pipeline of offshore wind farms

PROJECT PIPELINE	COUNTRY	CAPACITY (MW)
Rentel Offshore Wind Farm	Belgium	300
Norther Offshore Wind Farm	Belgium	370
Deutsche Bucht Offshore Wind Farm	Germany	252
EnBW Hohe See	Germany	492
Total		**1,414**

Source: WindEurope

WindEurope is the voice of the wind industry, actively promoting wind power in Europe and worldwide. It has over 450 members with headquarters in more than 40 countries, including the leading wind turbine manufacturers, component suppliers, research institutes, national wind energy associations, developers, contractors, electricity providers, financial institutions, insurance companies and consultants. This combined strength makes WindEurope Europe's largest and most powerful wind energy network.

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