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Deliverable D7.3
Website
V0.3

“New Concept of Affordable Wind Energy Generators without Blades - VORTEX”

VORTEX

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Website

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Notations, abbreviations and acronyms

DoA	Document of Action
WP	Work Package
D	Deliverable
PU	Public
C&D	Communication and Dissemination Activities
WP	Work Package
EU	Europe



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1. INTRODUCTION

This report intends to reflect part of the project activities carried out by VORTEX in the completion of *Task 7.3 Dissemination actions of Vortex outcomes (WP7)* defined in the DoA. This task has associated *Milestone 7.2 Project website in operation* and the present deliverable *D7.3 Website*. The present document, therefore, provides an overview of the project activity corresponding to the website objectives, construction and design.

Objectives

The purpose of the website is to inform the general public on the objectives and activities of the Project, and to store, freely available, dissemination material such as newsletters, public reports, deliverables, and publications. The website will be operating along the lifespan of the Project and will continue well beyond.

The purpose of advertising the outcomes of the Project in a website is to enable external professionals working in energy and renewable, the general public and any interested in our technological development to know about the VORTEX initiative, and hopefully to attract the interest of all of them in following the activities of the Project.

Objectives:

- To provide a friendly design and easy-use platform to inform stakeholders of the advances of the Project.
- To boost the future integration of Vortex device into the market and make it visible in the net as a definitive energy solution in Europe and Worldwide.
- To increase on/offline visibility.
- To improve internet search engine results in both, organic SEO and PPC (SEM).

2. VORTEX Public website

The website has been designed by VORTEX's Team in collaboration with the GoNext's Team. The website will be hosted and maintained by GoNext, as part of the activity subcontracted by VORTEX to this company. The website has been designed according to the standards set in "Article 38 - Promotion the action - Visibility of EU funding"- H2020 AGA - Annotated Model Grant Agreement: V2.2 - 25.11.2016.

The VORTEX public website will be launched on 15th December 2016. In order to capitalise on the VORTEX public website launch, several stakeholders and collaborators will be invited to the event (BSC, NanoInnova, SEO/Birdlife, etc.) as well as various national media (El País, El Mundo, etc.).

During the firsts months of the Project, the present-day public website of the company



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(<http://www.vortexbladeless.com/>) was adapted and the EC logo together with the disclaimer were added to the site fulfilment the standard set in “Article 38 - Promotion the action - Visibility of EU funding”- H2020 AGA - Annotated Model Grant Agreement: V2.2 - 25.11.2016.

The website is a major dissemination tool, with a potential large audience, intended to facilitate the spread of project’s information to different the stakeholder groups identified in the Project. This form for disseminating is the core element of the external communication strategy of VORTEX’s Project.

The web site eventually will:

- Ensure the visibility of the project.
- Facilitate the diffusion of the project's results.
- Promote their exploitation.

The official Project’s domain will be: www.vortexbladeless.com

Main requirements, Content and Context

The website contents a basic set of information about the fundamentals of the idea, VORTEX’s technology, the C&D activities, the impact and so on. A specific section will contain a brief description of the Project, main objectives, the WPs, the expected impacts and the possibility to download the deliverables classified as Public (PU). The website has been designed in order to comply with the following main requirements

- Integration of Social networks: Twitter, Linked In, Instagram, Facebook and Youtube (see *Deliverable 7.1*).
- Quick deployment and Cost Efficiency.
- Responsive web design, responding to the user’s behaviour and environment based on screen size, platform and orientation. Implementation following User Centered Design (Norman & Draper, 1986) and Usability (Abran et al., 2003; ISO 9241-11) principles.
- Multilingual capability: in order to be able to offer content in several languages - first version will only contain content in English.

Technical Specifications

The implementation of the platform CMS Wordpress for the management of the content of the website, V4.2.2.

Plugins will be included needed for the following functions:

- SEO friendly programming.
- Google Analytics statistics analysis.
- “responsive design”, design adapted to mobile devices.

LAMP Server (Linux, Apache, PHP and Database MySQL). Access to the hosting for the implementation in its pre-production environment; it is not essential but is recommended. Access to the production



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environment.

Management and Maintenance

The site will be regularly updated with the technological outcomes, findings and achievements, as well as with the Exploitation and Dissemination activities of the Project. Positioning of the site will be increased through active links (VORTEX's partners websites and other relevant EU projects, institutions and stakeholders, all related to the Project). The information contained in the Project section is likely to be valuable even after the project has finished. Therefore, the website, that will continue existing after the project funding has finished, will keep all the information related to the Project visible and updated.

All the information uploaded to the website will be previously reviewed in order to prevent VORTEX Intellectual Property Rights being put at risk.

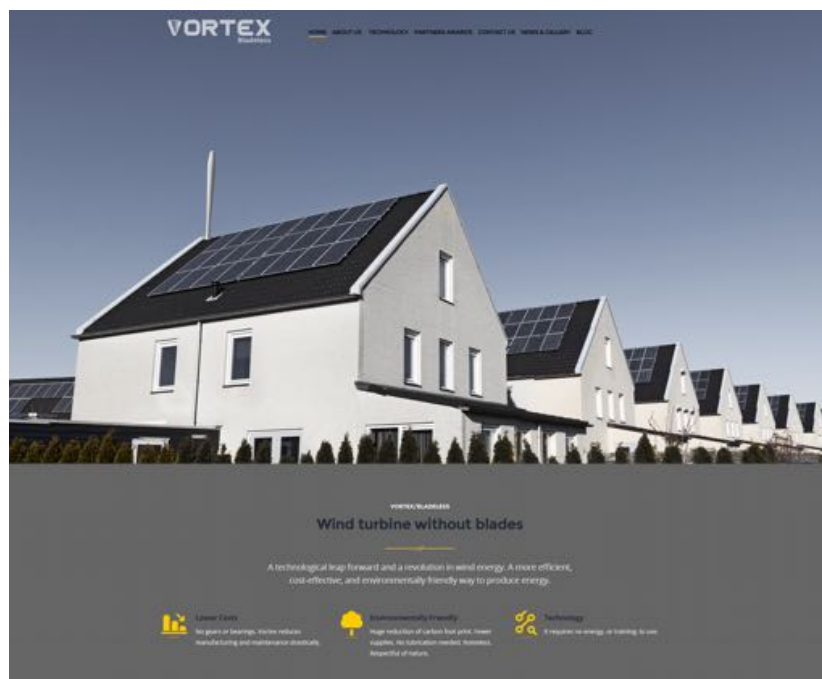
Website Design

The following tasks have been developed by the company GoNext in order to achieve the objectives mentioned above:

- Programming of Templates and Plugins.
- Installations, display, implementation of templates in the platform Wordpress and necessary plugins.
- Contents managements.
- Tests and supports.

Next images show the design of different website sections in order to provide an idea of the look & feel of the website:

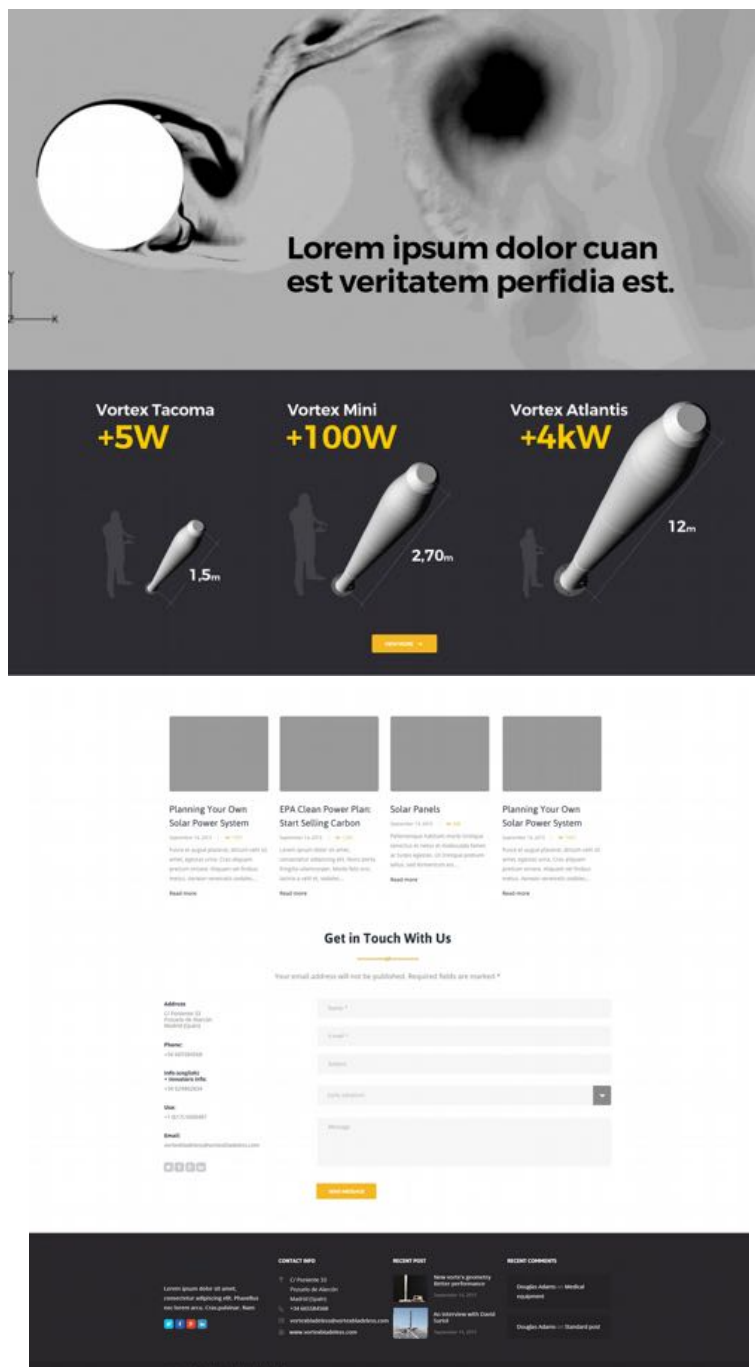
Figure 1. Preliminar Front Page of VORTEX website, section I.





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Figure 2. Preliminar Front Page of VORTEX website, section II.





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Figure 3. Preliminar VORTEX website, section technology.





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Figure 4. Preliminar VORTEX website, section technology.

The natural frequency of vibration depends on the body mass (increase in mass reduces the natural frequency), and the rigidity (more rigidity creates higher frequency). Therefore, the design of the Vortex generator is critical. The parameters, such as the diameter of the structure, height, total mass, are all designed to achieve maximum performance to the average observed wind speeds.

Vortex goes further to maximize the output from a given wind by modifying the rigidity. The top of the rod has a magnetic confinement system with permanent magnets that increase the apparent stiffness of the system according to their degree of flexion.

This system allows maximization of the oscillation amplitudes: when wind intensifies, the magnetic force of repulsion goes up, which reduces the distance between the rod and the magnet. As a result, the oscillation and the potential of generated energy increases to the maximum. With that, Vortex can automatically vary rigidity and "synchronize" with the incoming wind speed, in order to stay in resonance without any mechanical or manual interference.

03 / ALTERNATOR
GENERATING ENERGY: LINEAR ALTERNATOR

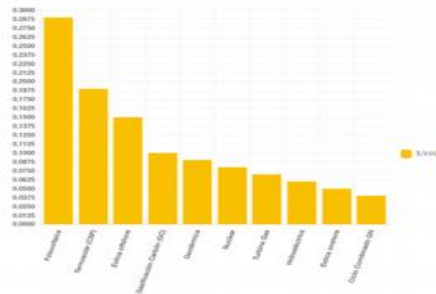
Currently, Vortex generates electricity through an alternator system, made by coils and magnets, adapted to the vortex dynamics, without gears or any moving parts in contact. Although the generator is a well known system, the way Vortex is using it, is innovative and patented. Our solution does not use any kind of gear and is supported by a repulsion system.

Vortex is designed with no moving parts in contact (or friction), which eliminates the need for greasing and maintenance. In any case, the preliminary tests show electrical conversion yields of about 70 % to 85 % of those obtained by a conventional rotary alternator.

04 / CHEAPER
...IT'S CHEAPER

One of the main advantages of VORTEX are the drastically low costs associated with the technology. In fact, the normalized cost of energy generation (COCE) for a typical onshore facility is 9.04 ¢ / kWh (about 35 Euros / MWh), including capital costs, operation and maintenance, performance, land taxes, insurance and other administrative expenses.

This put the technology at the very low range of capital intensity for such projects. It also makes it highly competitive not only against generators of alternative or renewable energy, but even compared to conventional technologies, as shown in the graph below.



These cost reductions come from its actually cheaper manufacturing costs: the tower and the generator equipment are, basically, one and the same. This allows us to bypass the need for a nacelle, the support mechanisms and the blades, that are usual costly components in the conventional wind generators. CAPEX costs are roughly estimated at around 51 % less of the usual wind turbine investment cost.

There is another differentiating factor that gives Vortex a competitive advantage over other field installations. By having the alternator (and the center of gravity) closer to the ground, Vortex facilitates assembly operations, use and maintenance, which of course does not occur in conventional wind energy, where a typical gondola is over 80 meters in height.

Having the center of gravity closer to the ground allows savings on foundation costs. This is good for onshore wind energy, and it's a real competitive advantage in offshore wind. The latter is notorious for the high foundation costs due in part to highly embayed centers of gravity.



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Figure 5. Preliminar VORTEX website, section technology.

Current wind turbine technology produces tremendous load changes under variable wind speeds, which puts high mechanical demands on rotating components such as gears, bearings, bushings, or brakes. The multiple moving parts are constantly under wear, which leads to high maintenance costs.

The design completely eliminates mechanical elements that can suffer wear and tear from friction, leading to an estimated 53% OPEX costs reduction compared to traditional wind.

Of course, it's not immune to fatigue. The wind causes bending and displacement of the structure, primarily in the elastic rod, especially in the lower section that has to withstand greater forces. However, a study carried out by the company confirms that the stress on the rod is far from working limits of materials, such as carbon fiber. Computational modeling estimates operational lifetime of the installation to be between 32 and 36 years.



03 / GENERATION

... MORE GENERATION CAPACITY.



Comparing Vortex with the same height of a conventional wind turbine, Vortex currently takes up as much as 30% of the area of a conventional generator, with maximum amplitude around a diameter at the top. It can capture around 43% of the wind power contained in the air (Betz Limit: 59.3%), which is a more than reasonable capacity. To sweep the same area Vortex needs to be higher than a conventional wind turbine. The system does lose some electrical conversion capacity (reaching 70-85% yield of a conventional alternator), because the design is so focused on avoiding wear and tear and because the uniqueness of the system.

Nevertheless, the bottom line is that the Vortex operating principle allows to:

- Remain in operation for a longer period of time. Early calculations estimates up to 55% increase over a classic onshore facility. The self-synchronization system allows to capture a wider range of wind speeds, starting from 2.3m/s.
- Eliminate, thanks to its design, the need to constantly adjust the installation for the best angle of the wind, with the consequent energy savings.
- Avoid any limitations associated with the "shadow effect", the disturbance of the downstream wind current, which is why wind turbines need to be installed at a certain distance from each other.

06 / GREENERT

... IT'S GREENER



Though a more rigorous analysis needs to be done, it appears that Vortex also has a number of environmental upsides to traditional wind power.

The Vortex aims to be a "greener" wind alternative.

The impact on the bird population is expected to be much smaller, because Vortex doesn't require the same type or magnitude of movement as the traditional wind turbine, allowing for higher visibility.

VORTEX
bladeless

We are an environmentally friendly renewable energy company offering eco products & solutions.

[f](#) [t](#) [v](#) [p](#)

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The Summit Startup Spain Competition 2014

September 12, 2016

Fondo de Emprendedores de la Fundación Repsol

September 12, 2016

RECENT COMMENTS



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3. Monitoring and Reporting

The website is a one way communication action, therefore the methods used to measure its impact is by analysing the trends in website visits. Several parameters will be analysed (by GoNext and complemented with Google Analytics) (see **table 1**).

Table 1. VORTEX Website Impact control file template.

VORTEX website Parameters	<i>1st Reporting Period</i>	<i>2nd Reporting Period</i>
Visits		
% New Visits		
Visits by Country		
Sessions		
Average Session Duration		
Sessions/Country		
Session by Browser		
Users		
New visitor/Returning visitor		
Page Views		
Pages/Sessions		
Map Overlay		



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