



# WAVE ENERGY: LEVEL 1

An introductory course on wave energy technology, from design to implementation.



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# Introduction

## Wave Energy: How Difficult Can it Be?

Wave energy has a huge potential, but the amount of installations worldwide are still limited. What is the reason behind that? Why did many concepts fail? Is it possible at all to extract energy from the waves?

The purpose of the course is to answer these questions and, at the same time, provide the participants with the basic knowledge needed to understand the technology.

The course is spread over 5 days and will cover the history behind wave energy, the most common solutions adopted, the limitations of these machines and the good practices to follow when designing a wave energy installation.

Participants will get a good understanding of the environment these machinery should operate in and on the forces involved. Furthermore, principles of design and testing will be covered with a learn-by-doing approach, meaning that participants will build scale models, which they will be tested in real-life conditions.

The course is the first step of a three-level series and it is a prerequisite to advance in level.

At the end of the course Folkecenter will issue a certificate of completion, which will prove that the participants have learned and understood the fundamentals of renewable energy.

For any further information about the course, you are welcome to contact Mr. Daniele Pagani, program coordinator, at [dp@folkecenter.dk](mailto:dp@folkecenter.dk).





# Syllabus

## Monday 2 March

- History behind wave energy;
- What is wave energy?
- Differences between wave energy and other ocean energies;
- Once Denmark was the leading country in the branch: what happened?
- Wave energy worldwide;
- Wave energy is difficult, so why even do the effort?

## Tuesday 3 March

- Different solutions of converters;
- Efficiency of the converters;
- When will we see wave energy in big scale?
- Details about PTOs, Mooring systems and review of different structures;
- Problems related to corrosion, sea water and marine-micro growth
- How can we build a test model of a converter, so that we can test its performances?

## Wednesday 4 March

- Model construction (in teams);

## Thursday 5 March

- Testing of the models (in teams);

## Friday 6 March

- Presentation of the test results by each team;
- Review of the material learnt;
- Delivery of the course certificates;



### **Christian Nereus Grant**

He has an education as technical designer and have been working for long time in the wave energy field. He has been site manager for the Wavestar platform in Hanstholm and worked also for Dexawave, after which he founded OctoMar Aps, a consulting company working with wave installations.

At the moment, he collaborates with different wave projects (Nemos, Reesen Weves and Wavepiston) and is president of the Wave Energy Association and board member of the Partnership for Wave Power.

With a daily work at DanWEC as a site manager, he has a unique position in understanding the challenges wave developers are in.



# Enrollment Fee

The purpose of the course is to form people on renewable energies, no matter what background do they come from; for this reason, the enrollment fee is designed to be as affordable as possible. We strongly support the participation of young and senior people, but also we want to encourage the presence of women in the renewable energy field and we want to do that by making the program more accessible to them. The table below summarizes the different enrollment fees.

Category	Fee	Equivalent to a discount of:
Normal	690 €	-
Women	500 €	27,5 %
Students <sup>1</sup>	500 €	27,5 %
Retired <sup>l</sup>	500 €	27,5 %

<sup>1</sup> A valid student card or other proof of enrollment should be provided upon registration

The course fee includes:	The course fee does not include:
<ul style="list-style-type: none"><li>• Access to all the lessons of the week</li><li>• Lunch</li><li>• VAT (25%)</li><li>• Shuttle service from/to Ydby Train Station to/from Folkecenter</li><li>• Invitation letter for visa application, if needed</li><li>• Final certificate</li><li>• Subscription to Folkecenter's Alumni Network</li></ul>	<ul style="list-style-type: none"><li>• Board and lodging, either than lunch</li><li>• Transportation from/to home country to/from Ydby Train Station</li><li>• Alcoholic drinks during lunch</li></ul>

Please, note that in case the minimum number of students is not reached, the course will be cancelled and the course fee will be refunded to the participants. Please, note that Folkecenter will not refund any other expense the participant has undergone through (e.g. transportation, accommodation, etc.).

In case of cancellation, participants will be informed no later than 15 days before the course starts.



# Payment Options

It is also possible to pay the course fee in two or three installments, as shown in the tables below.

## Two Installments

Category/Deadline	15 January	15 February
Normal	362 €	362 €
Women	263 €	263 €
Students	263 €	263 €
Retired	263 €	263 €

## Three Installments

Category/Deadline	15 December	15 January	15 February
Professionals	242 €	242 €	242 €
Women	175 €	175 €	175 €
Students	175 €	175 €	175 €
Retired	175 €	175 €	175 €



# Registration & Cancellation

Registration to the course must be done on [www.folkecenterevents.net](http://www.folkecenterevents.net) and the deadline for it is February 15, 2020. Please, note that there is a maximum number of participants: places will be assigned based on the first come/first served policy, In case the minimum participant number is not reached, the course will be cancelled. Participants will be notified latest 15 days before the first day of classes and the full course fee will be refunded. Please, note that Folkecenter will not refund any other expense the participant has undergone through (e.g. transportation, accommodation, etc.).

Participants can cancel their registration by writing a mail to [dp@folkecenter.dk](mailto:dp@folkecenter.dk). Please, note that the following policies apply:

- Cancellation before the 02 February 2020: full refund;
- Cancellation before the 10 February 2020: 50 % refund;
- Cancellations from the 10 February 2020: no refund;





# Nordic Folkecenter for Renewable Energy

Our ultimate long term goal is a complete replacement of fossil fuels and atomic power with renewable energies & energy savings while promoting the sustainability, resilience and development of local communities around the world. For this purpose, we have collaborated with local civil society organizations, research and education centers, companies, professionals and governmental authorities from all over the globe for decades.

Among others, we are an active and founding member of the World Wind Energy Association (WWEA), the European Association for Renewable Energy (EUROSOLAR), the European Renewable Energies Federation (EREF) and the International Network for Sustainable Energy (INFORSE). We are also the Danish coordinator of EUROSOLAR and the European Solar Prize.

## Our Activities

- Renewable energy training & information
- Transfer of Know-how and Best Practices
- Collaboration with Green Entrepreneurs and SMEs
- Testing & Demonstration
- Research & Development
- Implementation of Renewable Energy in Developing Countries

For more information visit [www.folkecenter.net](http://www.folkecenter.net).





**Nordic Folkecenter**  
for Renewable Energy

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*Working for a world running on 100%  
renewables since 1983*