



# New technology for storing green energy



**visblue**  
energy in the flow



The product of research

# Building a bright future for energy storage

**VisBlue was established by Adelio Mendes,  
Anders Bentien, Morten Madsen, and Søren Bødker in 2014.**

VisBlue is a spinout company from Aarhus University and the University of Porto, based on a patented invention made by Adelio Mendes and Anders Bentien. Morten Madsen brings his knowledge within the Power Electronic to the team, and Søren Bødker is responsible for the commercial part of the company.

In late 2014, Borean Innovation made an investment in VisBlue and the team behind the company. This investment ensured that VisBlue could develop the VisBlue product from the lab of the universities to a product that could be installed by the end-user. In the beginning of 2016, Luis Carlos Pérez joined the team, bringing his expertise in fuel cells and vast international experience to the company.

**"We see a very bright future ahead of us.  
Our product has so many obvious benefits that  
we can make it a great deal for every customer  
– whatever their energy needs."**

Just a few years from now, VisBlue expects to be an international brand on the sustainable energy market. The aim is to be a natural part of every major housing development where the energy

accounts include solar panels. Solar energy storage is a key quantity in the calculations and can easily determine whether the investment in solar panels will pay off – and whether the development will comply with statutory energy requirements. Our technology sets new standards for green energy utilisation... and development continues in pursuit of greater efficiency for less money.

**Adelio Mendes**  
Co founder



**Anders Bentien**  
Associate Professor, University of Aarhus,  
Technical advisor



**Morten Madsen**  
BSc.EE, Control



**Søren Bødker**  
CEO,  
Sales and daily operation



A great idea all round

# We make solar energy a brilliant deal – even at night

**"Our product should be considered by anyone who is thinking of getting or already has solar panels as a matter of course"**

Making alternative, sustainable energy sources even more attractive is a global concern. And that is precisely what we are doing at VisBlue. We make solar energy a brilliant deal, because our customers can store their energy and use it as and when they need it – instead of sending it back to the grid at a low export tariff.

## **Double the utilisation rate**

A typical solar panel owner uses just 30 percent or so of the solar energy produced, with the remainder being sold back to the grid. With our small system, the owner utilises nearly 75 percent, making solar energy a much better investment. And, strictly speaking, with a large enough battery, the owner could utilise all the stored energy.



**Buy power when  
rates are low**



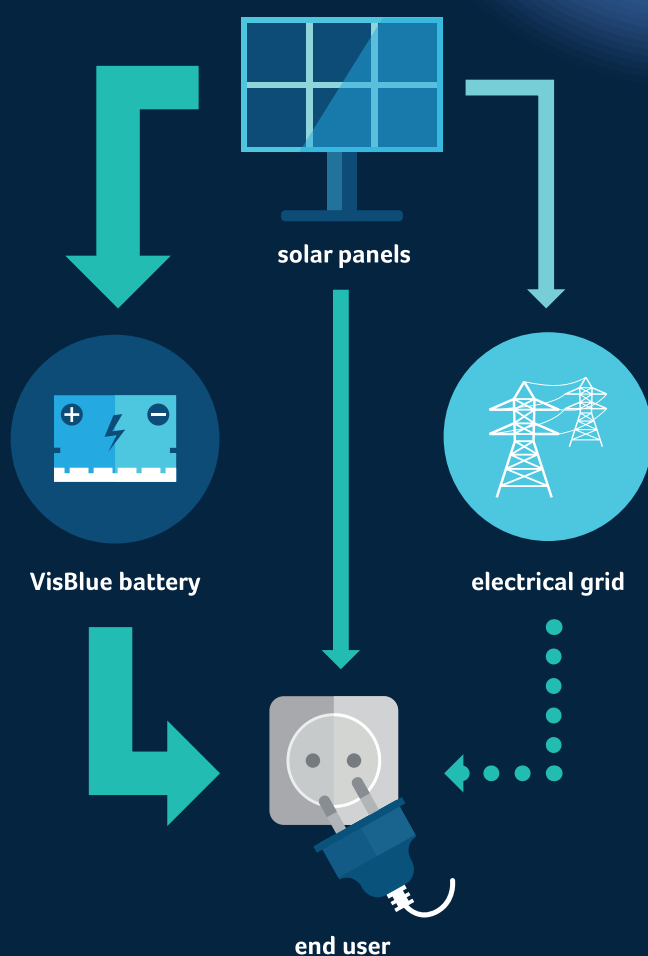
**Monitor  
your usage**



**Sustainable  
power**



**Use green energy  
at night**



**With VisBlue's revolutionary solution,  
our customers can monitor their usage patterns. So they can  
use the stored electricity at times when no energy is being produced  
from the sun, such as at night.**





**VisBlue has refined the technology and made it scalable so that it can be used in a variety of different contexts, e.g. in industry, in large blocks of flats and in private homes.**

**Calculated usage + Calculated savings  
= Optimum battery size**

Scalable solutions

# A revolution in energy storage: sustainable and scalable

**Revolutionary VisBlue technology should  
be of interest to anyone who wants to utilise the solar  
energy they generate more cost-effectively.**

It offers cash savings and at the same time boosts sustainability.  
All our solutions start with a specific calculation of the customer's needs and expectations. The fact that we can scale our solutions, so the customer gets the optimum solution from the word go, is one of VisBlue's great strengths. Our calculations are carried out using advanced simulation software, which we have developed for the purpose.

New battery technology

# A breakthrough for renewable energy

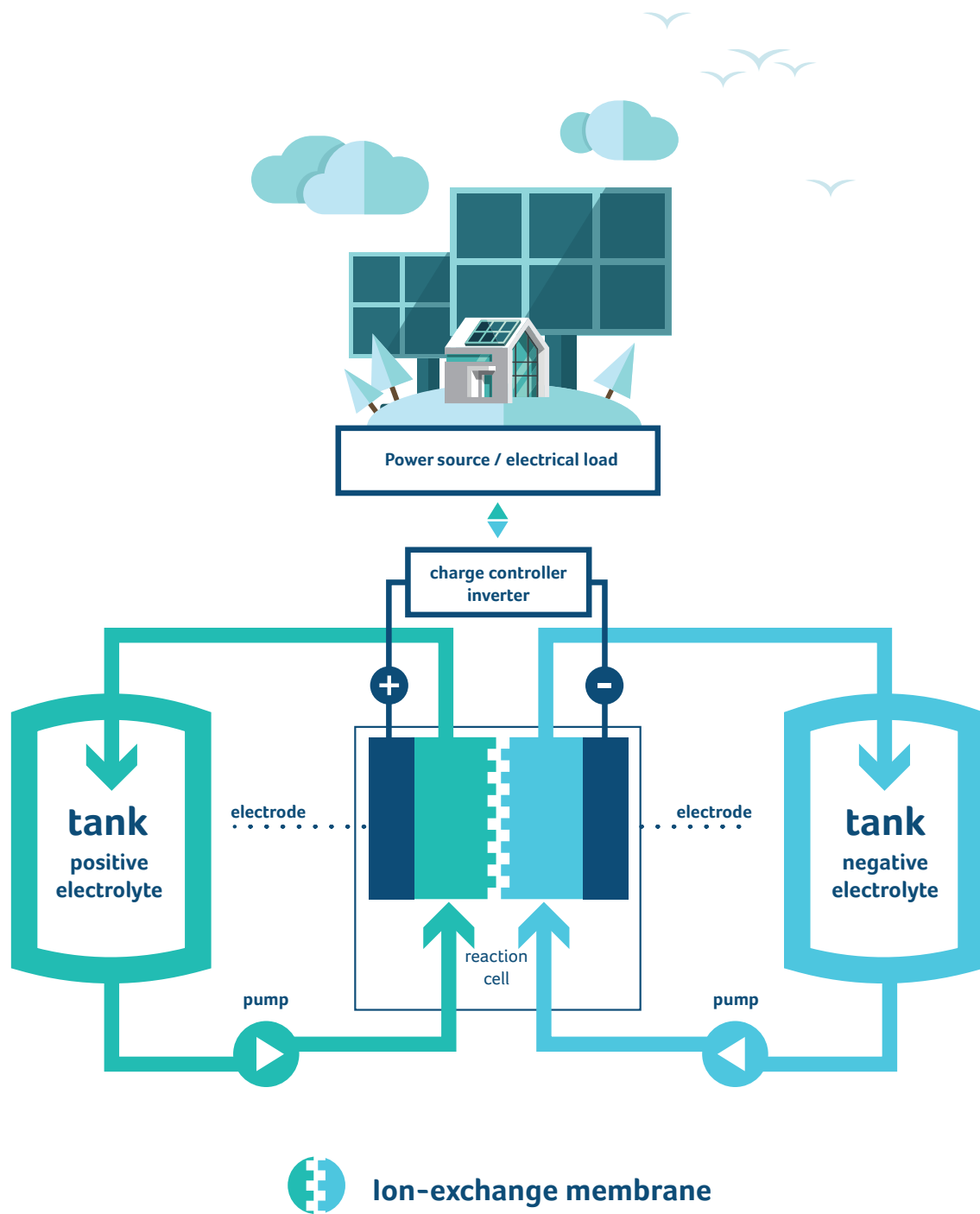
**“We are constantly refining our product and working in parallel to create the next generation of batteries with organic electrolytes.”**

The VisBlue battery solution is a Vanadium based redox flow solution. The technology provides a safe and more environmentally friendly battery solution that enables you to storage more of the energy that is produced in your solar panels. The VisBlue redox flow battery solution can scale the power and capacity, independent of each.

## How a flow battery works

- A vanadium redox flow (VRF) battery has two separate tanks, one containing a positive and one a negative electrolyte. Both electrolytes consist of the element vanadium dissolved in sulphuric acid, with the vanadium occurring in different oxidation states (valences).
- The battery also has a number of battery cells. Each of these cells is divided into two chambers separated by a membrane, through which the ions can pass. In each chamber is a positive or negative electrode. The two electrolytes are pumped through the cells on their side of the membranes.
- The current from the solar panels is fed down into the cells' electrodes, where it moves electrons from the positive to the negative electrolyte, charging the battery as the liquid flows back into the tank. During discharge, this process is reversed.







More than **95%** of all the components  
in a VisBlue battery can be recycled

Solar energy storage pays

# Benefits of VisBlue's flow battery

## **Large savings**

Our solution provides savings from day one. The customer utilises a much higher proportion of the free solar energy and so has to buy less electricity.

## **Scalable to suit requirements**

Whatever the requirement, we can adapt the solution to the precise capacity needed by the customer. It should pay to be environmentally conscious.

## **Long life**

The battery can be charged far more times than either lead or lithium-ion batteries – around 10,000 times – and without affecting capacity either.

## **An eco-friendly solution**

VisBlue makes the world greener. We boost the utilisation rate for solar power and make our batteries from recyclable materials.

## **Security against tariff changes**

VisBlue's customers buy less electricity and so are less vulnerable to political measures and changes in the export tariff for surplus electricity.

## **An asset when selling**

VisBlue looks good in energy accounts and will help make your home more attractive when you come to sell it.

## Want to find out more?

We are always happy to have a chat about our solutions – and, not least, what they can do for you.

### **VisBlue**

Bautavej 1A  
8210 Aarhus V  
Denmark

Rua Alfredo Allen 455  
4200-135 Porto  
Portugal

ssb@visblue.com  
+45 2166 3575

### **VisBlue's backers include:**

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