



# NEWSLETTER

December  
2007

## Editorial

Dear YES-DC members,

During the last two months, two new YES-DC Activities have been organized. The first of these activities, "The Future of the Dutch Energy Supply" gave us the opportunity to learn more about new and innovative plans for our Energy Supply. In this Newsletter, you can find a report about the enthusiast presentations of these plans by Benno Wiersma (Sunergy) and Frits Verheij (KEMA). The second activity, "Light in Dark Cambodja" informed us about employing energy in Cambodja. It was the closure activity this year. Unfortunately, a report of this activity could not make it to the deadline of this Newsletter. It will be published in the first Newsletter of 2008.

I hope that this somewhat shorter Newsletter informs you about the latest developments within YES-DC. Finally, I wish you all a very good 2008!

Kind regards,

Hans van Kuijk

## Chairman's foreword

Dear members of YES-DC,

The end of 2007 is approaching, a year has been very interesting for us all working in the field of energy, environment and international co-operation. From my point of view, the most important challenge of our work field in general and YES-DC in particular, was and will be to create lines to other disciplines and work fields that are interested but are not yet involved in the same issues. Where the world is recognizing the importance of the topic we are working with, it now is the time to learn from each other and work together. In collaboration with other associations such as Young Shell and the International Advertising Agency, we have been able to organize activities that are in line with the more and more integrated approach towards problems related to energy and climate. I hope we can continue this approach in 2008.

2008 will also be the year in which another DEO-day (Duurzame Energie & Ontwikkeling) will be organized. The DEO-day is a conference for which several specialists of one specific topic are invited. We are still looking for enthusiastic members that would like to help organizing this event. Also, the Board of YES-DC for 2008 is not yet completely filled; if you are interested in taking part of leading YES-DC and organizing activities in a motivating team, you are more than welcome. For both topics you can ask me or anyone else of this year's Board for more information.

I wish you all an energetic new year!

Haike van de Vegte

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## Colophon

The Newsletter is distributed by YES-DC (Young energy Specialists and Development Cooperation) to their members 4 times a year. Subscription to the newsletter is free of charge and can also be downloaded from the YES-DC website. For any further questions or suggestions feel free to contact us.

### YES-DC Board 2007:

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**Newsletter** Hans van Kuijk  
**Website Co-ordinator** Joost van Stralen

**Website** [www.yes-dc.org](http://www.yes-dc.org)

**E-mail** [info@yes-dc.org](mailto:info@yes-dc.org)

**Editor** [h.a.j.a.v.kuijk@tue.nl](mailto:h.a.j.a.v.kuijk@tue.nl)

**Graphical Design** WingF Kwok

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# The Dutch energy supply

*new and innovative plans for the future*

**On the 28th of November, YES-DC members gathered for the activity “The Dutch energy supply – new and innovative plans for the future “. Two speakers were invited, Benno Wiersma from Sunergy and Frits Verheij from KEMA. Benno Wiersma convinced the audience that the technology of Sunergy for solar cell production will become very profitable on the short term. Frits Verheij explained the idea for an Energy Island to store energy and pointed out that this could be a future showcase for the Netherlands.**

## Author: Joost van Stralen

### Plans of Sunergy: Benno Wiersma

Benno Wiersma gave a very enthusiastic presentation about the plans and activities of Sunergy regarding photovoltaic (PV) solar cells. Realizing big plans are according to Mr. Wiersma achieved by following the five D's: Dromen, Denken, Durven, Doen en Doorgaan (dreaming, thinking, daring, doing and having endurance). What Sunergy wants to achieve can indeed be seen as very ambitious goals. The expectations of Sunergy are that PV solar cells will be competitive in less than a decade! This is against what people often believe: “solar cells are way too expensive and they will never be competitive”. However, Benno Wiersma is

convinced that there is an enormous future for PV cells and that the cost reduction developments will go way faster than common expectation.

Mr. Wiersma showed the so called “Sol Alamos” spider web. Walking along this spider web gives eight different partial problems that have to be or are partially solved. Going inside the web, five different phases have to be passed: research, development, pilot phase, transfer production and production. For each of the partial problems there are one or more partners who collaborate, for example for the part “module fabrication” Philips and ECN are partners, each bringing in particular expertise.

In practice the Sol Alamos idea resulted in the “PureSilicon” manufacturing process: accelerating cost reduction through integral production. In this process each manufacturing step is optimized for the integral concept, this is, besides some other innovations, one of the key factors that should result in a huge cost reduction. Another important innovation that plays a big role in the plans of Sunergy is the so called RGS process, Ribbon Growth on Substrates. A process which makes it possible to make very thin ribbons.

In the upcoming market for PV solar cells, Benno Wiersma hopes that The Netherlands will play a prominent role. The Netherlands has an excellent know-how position in solar energy and it is to be hoped that this will result in a strong solar energy industry, in contrast to what happened in the wind industry. The know-how that The Netherlands should be turned into products. A general remark of Benno Wiersma was that know-how should be made more useful, in R&D the focus should be more on the D, not on the R. The optimistic, but very interesting expectation of Wiersma is that Solar electricity costs will be reduced 3-5 times around 2012, making the price of solar electricity the same or even lower than the consumer price of electricity. To achieve this, no break-throughs are required. It is clear that these developments might have a huge impact on the future of our energy system, not only in The Netherlands, but also in developing countries, since the generation of electricity might become affordable for them. The philosophy here is “E4E”: Energy for everyone.

**Around 2012 solar electricity will be competitive in The Netherlands.**

## Energy island: Frits Verheij

Frits Verheij (KEMA) discussed the plans for an energy Island. KEMA and Lievense performed a feasibility study for an energy island. The main purpose of the island is energy storage. The basic principle of the energy island is that, by changing the water level in the lake, electricity is turned into potential energy and vice versa. This idea originates already from 1981, the so called "Plan Lievense". Water had to be pumped from the IJsselmeer into the Markermeer using electrical power during a low demand for electricity. The level of the water should be lowered during high demand for electricity. A main problem with this idea was that the water level of could become too high which could result in dangerous situations.

However, the original idea saw new light in a revised version recently: the energy island. KEMA and Lievense joined their expertise (energy consultancy and civil engineering respectively). The reasons for the plan of an energy island were several. The government aims at large volumes of renewables, because of the climate problem, security of supply and the reduction of the fossil reserves. To fulfill this goal offshore wind energy is a very important factor in the Netherlands, because of the huge potential. However, since the production of electricity using windmills is not directly related to the demand for electricity, electricity needs to be stored for the balancing of electricity demand and supply. Another factor that plays an important role for the development of this plan is the strong offshore industry that The Netherlands has.

The energy islands (or islands) should be situated in front of the Dutch coast and can also have a protective function against waves. Another very important difference with the original Plan Lievense is that, in case of the energy island, the water level of the lake is lower than the water of the surrounding sea. The energy island is an open pit that is surrounded by a ring of dikes. The surrounding sea works here as a pumped hydro facility. A very important technical factor is the availability of a thick layer of clay (about 40 meters). Clay

has the property that it is very difficult for water to slip through, a property that is required because otherwise water would penetrate from the bottom into the lake (due to the pressure difference) and the level of the water in the lake would rise without the effect of generating energy. An extensive analysis, using different

**You have to think small, not big!**

scenarios, by KEMA and Lievense shows that the energy island is feasible, both technically and economically. Calculations showed that the optimal size of the island results in a capacity of 1250 – 2500 MW. The combination of electricity storage and wind energy has several advantages: First of all, an increase of the technical reliability of power supply. Second, since electricity can be stored during low demand and given back to net during peak hours, the costs of electricity will be more stabilized. Another advantage is that it allows larger volumes of electricity to be produced by intermittent sources like wind power, which without storage would be very difficult. Due to the use of wind energy, CO<sub>2</sub> emissions are reduced.

**Like the Delta Works, the Energy Island could serve as a showcase for The Netherlands.**

Besides these advantages, the energy island also has secondary functions. For the energy sector, the island can be used to locate wind mills, it can also serve as a source of aquatic biomass. Also a biomass power plant could be situated on the island, together with a harbor for

biomass and LNG. It could also serve as a location for a harbor and other port facilities. An important social function of the island is its role as coastal protection. The island could also be a tourist attraction.

The feasibility study of the islands will start a second phase, where some aspects are considered in more detail. Among these are the environmental impact and a study of a possible market and ownership structure. However, by far the most difficult obstacle for the realization of an island will be social, administrative and political feasibility.

## Discussion

During the discussion some interesting points came to light as well. To Benno Wiersma the question was asked who the clients will be. Benno Wiersma thinks that most of the solar electricity technology will end up in consumer products. The philosophy was that you have to think small! Thinking the big way is not good. An analogy was drawn with the computer. First the focus was on mainframes, but the computer industry really started to boom with the development of the PC. Another interesting question that was asked was about transport. Since quite a lot of energy is used in the transport sector, people wondered if solar energy might play a role in transportation. However, if the whole chain is solved one comes up with the use of batteries. An interesting side remark of Benno Wiersma was that he doesn't believe in hydrogen as a storage system, but in batteries.

People were wondering if the idea of an energy island could also be exported to other countries. It could be, but it really depends on the permeability of the bottom of the sea. Rocks could work. Another question from the audience was that The Netherlands could be too small for a challenging project like the energy island. Who would have to initiate this project? Dutch companies are believed to be too small. Therefore, several companies would have to cooperate in a joint project. ●