

GREEN MONEY: INVESTING INTO SUSTAINABLE FUTURE

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Peter LIU

Founder and Vice Chairman - New
Resource Bank (USA)

Virginie CARNIEL


Chief Operating Officer - Nolaris
(Switzerland)

Deeti VYAS

Development manager - Trucost (UK)

Modérateur: **Anne-Catherine HUSSON-
TRAORE**

General Director - Novethic (France)



With the Copenhagen Conference on climate change about to start on December 7, there is no better moment to discuss the investment opportunities in the field of green investments. The panel session gave an overview of the various aspects investors take into consideration before investing; the type of investment, the opportunity and returns of the investment, the financing capabilities and the audit of the company.

In this report we shall first give an overview of the various types of investments available to private investors, after which we discuss one typical example of an investment opportunity; the solar islands of Nolaris. Peter Liu, the second speaker, and his New Resource Bank continue with how the bank finds

and invests in green projects. Finally, Trucost is presented by Deeti Vyas. Trucost is an environmental auditing company which assesses the carbon footprint of a particular company and provides the information to (possible) investors, governments and organizations.

Introduction to Green Money

The presentation of the topic started by an overview of the various ways in which private individual investors are able to invest into Green investments. The investments were separated into 2 categories: direct investment into green projects and financial instruments.

Investing directly into green projects can be done individually or collectively. Individual investments may still be profitable to investors but on a smaller scale. The size of the investment means that individuals are limited in the types of projects they can invest in. They would not be investing in large solar power stations but in smaller projects such as solar panels on roofs for households. The investment return is medium 8 % over a 20 years period. The initial investment outlay of such projects will drop due to a drop in material costs and improvement in implementation costs.

Collective Direct investments contain investments in Solar Parks or wind farms. These types of investments have a longer payback period, different risk characteristics and high upfront investment. The type of investor in such projects differ as well, because the cash flows are more stable once the initial investment has been made, but there is no



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risk diversification if there are problems with the project.

Financial instruments are a solution to reduce risks of single project investments. This is the second category of investing and it allows investors to tailor their investments to their risk profile, the preferred payback period and the level of risk. Investing in financial instruments could involve investing directly in shares or bonds of a green company. One disadvantage is the high transaction costs to obtain sufficient amount of information about the company.

Mutual Funds and Private Equity funds offer a solution to this by lowering the risk and transaction costs. They also provide flexibility in risk preference with risk adverse investors opting for mutual funds and Private Equity taking more risky projects. Private Equity firms are focused on start-ups and untested technologies which have a huge potential but also have a large amount of risk attributed to them. Investors are sometimes wary of investing in these types of investment given that even established investments, such as solar parks, have difficulty in being recognized as a financially sound investment. This diversity in risk profile and types of investments however, is beneficial as it broadens the range of the type of investor who would invest in such projects.

One negative side to both mutual and private equity funds is the management fee involved in paying for the risk diversification and risk profile.

In short, private investors have a wide array of areas to invest in, and have to

choose from each criterion their own preferred internal rate of return, energy type, technologic maturity and their own risk profile. This indicates that green investments are a developed and consolidated industry, which can tailor to the preferences of the investor, just like more well known investment sectors.

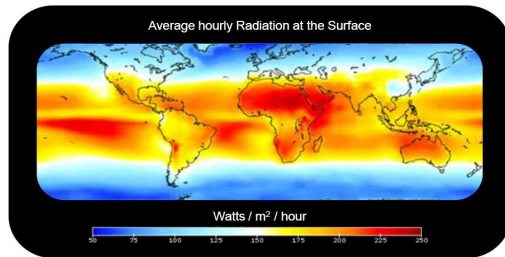
Below we shall discuss the speakers of the sessions and then conclude with findings and remarks.

Presentation 1: Solar Power projects by Virginie Carniel (Nolaris)

Nolaris is one of the many (successful) start-ups of CSEM (Swiss Centre for Electronics and Microtechnology). It is also one of the most innovative firms in its industry, i.e. the solar power industry. Thanks to the know-how of its mother company and the extensive technological knowledge of its engineers and R&D department, Nolaris can rely on a very strong team to face the challenges ahead. The presentation at World forum was about Nolaris' groundbreaking concept of **solar islands**. Nolaris wants to use the never-ending solar power to supply large areas of the world with clean, renewable and affordable energy in various outputs such as electricity, cooling (Air Conditioning), hydrogen, etc... It wants to achieve this by placing very large artificial floating islands (with diameters up to several kilometres), ideally in places where the sun can be exploited at a maximum level, i.e. between the tropic of Cancer or the tropic of Capricorn, as shown in the picture below.

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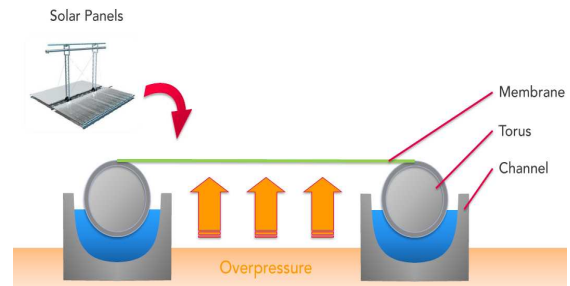
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These solar islands are equipped with a rotation system which allows the platforms to move in such a way as to maximise the solar energy as much as possible. As the most important factor in developing energy from solar power is the intensity of the sun, the angle at which the sun rays actually hit the solar panel is pivotal in this. Thanks to this rotating system, Nolaris has developed an efficient system to take advantage of it.

Finally, another very interesting feature (still to be tested extensively of course) of these solar islands is the fact that they could be installed on land as well as on water. If the tests on water are successful, this could potentially be a huge breakthrough as there is an enormous amount of solar power to be taken on water (as can be seen again from the picture above). Challenges regarding these solar islands on water would be first of all the waves, but also traffic, storms, etc..

We will not go too much into the technicalities in this paper, but we shall at least describe the basics regarding this great green concept. The main elements of such a solar island are the solar panels; the membrane, the torus and the channel (see illustration below left).



Basically, the torus floats on the water channel and an overpressure is applied underneath the membrane which helps support the load of the hundreds of solar panels. In function of the hitting angle of the sun rays, the whole island rotates allowing for an increased efficiency of sun usage. Next to the schematic presentation above, you'll find a real-life prototype which Nolaris is currently testing in the United Arab Emirates.

When comparing these solar islands to other forms of green energy, we find arguments in favour of the various methods that already exist. First of all, let us compare it with photovoltaic (PV) energy. The main advantage when using photovoltaic panels is the direct electricity output. It is now also a well-known technology which has already been proven worthy. On the other hand, PV panels are quite expensive (state subsidies may help here though), there is a maintenance (cleaning) issue, which obviously has an effect on the efficiency of the system, and



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it is rather difficult to store energy (which is not the case with the solar islands). When comparing actual figures, the solar islands have a bigger potential than a PV plant.

Wind energy is also a well-known and ever-increasing form of alternative green energy. The system is now well under control, but there will always be an issue regarding the efficiency of running these wind turbines. The advantage of wind turbines is that they can also be placed offshore and hence fully exploits the winds on the oceans. However, the amount of energy they produce is significantly less than the potential energy creation from solar power.

In conclusion, we would like to stress that the concept of solar islands is a great and possibly groundbreaking idea. If this project works and supplies a decent amount of clean energy at a reasonable price, we could very well be heading towards a new energy era. For a few years already wind turbines and PV have shown us that these green energies are very popular among many consumers who are ready to pay slightly more for cleaner energy in order to “save the planet”. If Nolaris’ solar islands project generates the desired results, and if the R&D in that domain is sufficiently funded, the scale of the concept could explode and we might soon find ourselves using mainly clean and green energy (wind, PV, solar power and also others that are still in the pipeline) instead of the traditional, more polluting forms of energy such as petrol and nuclear power.

Presentation 2: Lending to promote sustainable resources by Peter Liu (New Resource Bank).

New Resource Bank is a regular, California-based bank with admission of investing in green projects and fostering a green community. It was founded in 2006 by Peter Liu and other successful entrepreneurs with high environmental awareness. The common belief for all founding investors was that green sector is moving from social responsibility to a market opportunity where businesses can bring sustainability into the society by offering greener and more efficient products.

The basic idea of the New Resource Bank is to use its lending facilities to promote investments in clean technologies, energy and sustainable resources. The bank focuses mainly on clean energy projects and green buildings, but it also supports companies that deliver environmentally sustainable consumer products. To encourage these types of investments, the New Resource bank also gives preferential rates on its loans.

So far, the New Resource Bank has supported green projects in total value of 200 million USD and it is the fastest growing bank in California.

In his presentation, Peter Liu spoke about three classes of projects with regard to investments.

- Financing and investing in commercial projects. These investments are relatively low risk because they are based on proven technology like wind energy or photovoltaic. However, investing in



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energy efficiency is still underdeveloped. Projects are usually financed by banks, but they are still dependent on government subsidies, because they still cannot compete with traditional fossil energy resources. Due to this, their margins on lending are very low and therefore the bank will have a thorough process of due diligence not only on the books, but also in technology and management.

- First commercial scale projects. They have been proven in pilot versions, but are about to expand into commercial scale. Examples include solar-thermal projects, concentrated photovoltaic or reforestation.
- R&D stage projects. These are laboratory experiments working on technological breakthrough, whose commercial application will not be constrained by high costs. Cellulosic or algae bio fuels and harnessing of ocean power belong to this category.

Although since 2001 investments into clean energies and renewable resources have been on a steady rise, the sector was also hit by 2008 crisis. We observe that investments into clean energy are strongly positively correlated with oil prices; higher oil prices lead to increase in clean energy investments. However, prices of oil fluctuate more based on global geopolitical situation rather than the actual demand-supply relation. The challenge the green industry is facing is how to attract investments into clean

energies based on a worrying climate change rather than midterm oil price fluctuations. A positive sign is the fact that improving society and quality of life is a growing industry.

Financing the green energy investments can be grouped into three categories.

The first and largest category is commercial projects and assets with proven success (19, 6 bn. USD, 75%). Financing implementation of these low risk projects is usually provided by banks. The second category of financing is public markets, with a share of 17% representing 4,5bn USD.

Venture capital and private equity provide financing for new technology companies and they represent the smallest category because of the high risk present in the projects (8%, 2, 2 bn. USD).

Peter Liu presented a cost curve from a study done by Swedish utility Vattenfall and McKinsey & Company. There are measures to reduce carbon emissions which are more interesting to implement from the cost-benefit point of view. Investing into energy efficiency (such as insulation) and fuel efficiency have higher returns compared to costs and they are most likely to bring long term benefits to society in terms of energy savings and jobs creation.

In the current U.S. energy sector, Smart Grid is one of big opportunities that attract large mainstream companies such as Cisco, but small start-ups as well. A subject present in smart grid network can generate electricity (for example through solar panels) and sell it back to the electric grid. This way the overall supply of electricity is being replenished by clean



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energy which consequently reduces carbon footprint.

New Resource Bank is also interested in the sector of water, where they finance solutions leading to decrease in water wasting.

In order for the “green” to move from social responsibility to a sustainable market opportunity, the wider society must be concerned and it must demand green products and green energy. Liu claims that general public in the U.S. becomes increasingly interested in green economy. According to the survey done in the U.S., 63% of respondents wants a smart grid solution, 15% of them are willing to pay more for such a service. This global turnaround is also confirmed by the Boston Consulting Group study. The polls show that 80% of Europeans are willing to pay a premium for green energy products, with North America and Japan showing similar figures.

Presentation 3: Assessment of environmental criteria of listed companies by Deeti Vyas (TruCost)

Deeti Vyas is a Development manager at Trucost, and she was the third speaker in the discussion about Green Money. Trucost was founded about 9 years ago and has specialized in providing data for organizations, investors and governments about companies’ environmental impact (emissions and resource usage), leading to a better understanding on the different businesses footprints. Their approach focuses on delivering financial and quantitative data for a more educated debate among the different stakeholders.

Currently they have the world’s most comprehensive data on corporate environmental impact. Nevertheless, the overall market scenario shows a lack of transparency when it comes to environmental impact information, of the FTSE100 only 10% of companies provided full disclosure, 75% - partial disclosure, and 15% do not disclose anything, while from the MSCI Europe 20% give full disclosure, 50% partial, 30% none.

Trucost focuses on translating this environmental impact into comprehensible data because it believes that this kind of externalities affect a company’s current and future performance, both in terms of efficiency and image.

The main environmental externalities identified were greenhouse gas emissions (65%), water abstraction (18%) and air pollution (7%). These are scanned across each company’s business and the whole supply chain and are identified according to the specific impact they have, in order to clearly see the source.

When the study is not solicited, Trucost sends the report back to the company, allowing the opportunity for clarification.

Currently, Trucost’s database covers 70% of the Global Markets by Market Cap (more than 4,000 companies) and its standardized quantitative approach offers the possibility of cross-comparison of business sectors and geographies.

Stakeholders will use this information in different ways according to their role:



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- the company itself will use it to understand what are the environmental risks in terms of financial impact, and incorporate this information in its business strategy in order to create more environmentally friendly products and use the most environmentally efficient production processes
- investors will look into the financial translation of environmental risks, which will help them monitor investment performance, and take environmentally conscious investment decisions, eventually rewarding those companies that are being more efficient
- governments will use this information to understand where they should tighten regulation and put incentives in place

In this presentation, we further looked into some examples and peer analysis on how the environmental impact and its disclosure relate to company's profitability. The analysis of those companies has proven that one can reduce environmental risk without compromising the returns.

Carbon Efficient Portfolios

Although it's still not possible to completely exclude companies with negative environmental impact from investor's portfolios (since this would probably mean the exclusion of some vital sectors), it is already feasible to select within each sector, those, which are doing better in this field. This means that investors can, to a certain extent, already

chose not to finance companies that do not engage in best practices as far as environmental concerns go.

Trucost has worked with Hendersen on carbon footprints for two of their SRI Funds and now they actively use obtained information to channel money towards cleaner companies and to start a discussion about what other companies are doing to reduce their environmental risks. During the past four years they took action on the information provided and managed to reduce the carbon emissions in their portfolio.

These concerns are also being pushed by the Environment Agency (with whom Trucost has been working), which will question fund managers regarding their environmental performance of every company they hold in their portfolio.

During the presentation we had the chance to look into some examples of indexes that target companies which actively pursue environmentally responsible strategies. One of those was UBS Carbon Optimized ECOSTOXX 600, which basically shifted the weight of the portfolio from the most inefficient to the most environmentally efficient companies, keeping the same sector distribution. Another example is the S&P US Carbon Efficient Index that keeps the same sectors weights but excluded environmentally inefficient companies. Finally there is Euronext Low Carbon 100, which uses a similar approach to the S&P US Carbon Efficient.



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In all three indexes it's can be see that although performance didn't stray from the regular portfolios, there is an average 30% less carbon emissions.

In conclusion, Ms.Deeti VYAS defended the argument that it is possible to reward environmental efficient companies without compromising financial returns.

Conclusion

The panel discussion achieved its main goal of informing those who had attended it about the various possibilities available in Green Investments. The discussion touched on many topics from the diversity of investment possibilities to an actual case study, from financing a project to environmentally auditing one.

In short, the discussion presented how green investments are an actual viable alternative investment opportunity not only for the future but also for today.