



Government *of* Aruba

JUNE 2015



2020 *VISION*

GREEN DECK | ARUBA

“In Aruba, we are looking forward to achieving our first Green Hour of electricity completely generated by renewable energy, and then our first Green Day, Green Week and so on until we have achieved our ultimate goal.”

M.G. EMAN
PRIME MINISTER OF ARUBA





THE VISION

Striving to successfully meet the challenges of the global economy on new terms, we, in Aruba, have set the course to fundamentally transform leadership with social economic progress based on smart growth; capable of addressing the enormous challenge of delivering a lasting prosperity where green and sustainable initiatives will lead to wellbeing for every Aruban. As the record has shown, our approach has been comprehensive and inclusive of all sectors of society to ensure the sustainability of our milestones since taking office for the first time in 2009.

As part of Aruba's strategic transformation, we are shifting towards long term gain investments in city and neighborhood renewal, citizen engagement and overall wellbeing. The approach is "a special Aruba to live in is a special Aruba to share with our visitors". This implies a renovation of the sense of public spaces, of public institutions, of common purpose, such that it will impact the very way our citizens and visitors experience our green areas, parks, recreation centers, libraries, museums, public transportation; in short, the overall experience of Aruba. With national programs "Bo Aruba" and "Bo Bario", Aruba is setting physical and social building blocks for enhanced quality of life and a new vision of social participation; setting a proper balance between these vital dimensions of what it means to be human and how we relate to our environment. This is a balance that has been lost in our lives, in our institutions and in our economies. The pursuit of happiness and wellbeing are the cornerstones of Aruba's vision.

Faced with high energy costs and a strong need to protect our environment, Aruba has set a policy in turning sustainable growth into sustainable wellbeing. In 2009, the government of Aruba introduced a new strategy for its utility services, prioritizing the inevitable environmental concerns of our small island and also moving away from reliance on the fluctuations of the oil market. This approach was crystallized in the 100% sustainable energy target for 2020, announced at the Rio+20 conference in 2012, its flagship policy aim. We believe that our green initiatives will lead to sustainable growth and wellbeing for our country and our citizens.

Our 2020 Vision embraces sustainable development. I hope this document demonstrates a snapshot of the process, milestones, and initiatives we have taken to validate our approach to smart growth which can only be possible with the continued collaboration of our strategic partners, along with pioneers for sustainability.



Government of Aruba

**Minister of General Affairs, Science,
Innovation and Sustainable Development**

Mr. Michiel G. Eman



FOREWORD

We have made much progress in our path towards 100% sustainability. The Government of Aruba started its journey in 2009 with our first annual Green Aruba conference in 2010. The aim was to set the foundation for a catalyst of change where Former Vice-President Al Gore lent a hand to set the tone for a future 'Green Aruba'. Since then, Aruba's vision has spread to the region and the world.

Aruba has set its goal to become 100% independent of fossil fuels by 2020 with electricity and potable water generation. In order to achieve this, diversification of the economy through the Clean Technology initiatives have to be taken, including diversification through sectors that have the potential for long-term sustainable growth and the ability to develop a highly trained and educated workforce. By the end of 2016 we would have achieved almost 50% of penetration of renewables in our energy and water production.

Utilities Aruba NV, together with WEB Aruba NV, NV Elmar and all the other energy stakeholders, are essential in realizing the sustainable vision set forth by this government and they have all been determined to execute it along with us, together. Today we are taking practical steps to reach our goal by gradually transforming the energy sector from one that depends on fossil fuels to one that is fundamentally renewable, but also affordable. More so, Aruba hopes it cannot only set an example for its neighboring islands and region in renewable energy and sustainability, but share its knowledge and best practices with them as well.

There is growing realization that just as we cannot keep living on this planet as if we had another one to go to, we cannot live on this island as if we have another one to inhabit. By hosting the Green Aruba conferences, we offer both public and private sector, locally and internationally, the opportunity take a close look at the Aruba model and to participate in its development by using it as a platform to do business between Latin America and Europe, namely the Green Gateway. The move to renewable energy can create not only a cleaner environment but also generate great economic opportunities and growth for all whom are willing to participate in it.

Our ultimate goal is to create a socially, environmentally and economically resilient island that takes advantage of efficient use of its abundant natural and clean resources and to implement projects that will sustain high quality local jobs for current and future generations.



Government of Aruba

**Minister of Economic Affairs,
Communication, Energy
and Environment**

Ing. Mike E. De Meza

TABLE OF CONTENTS

06	GREEN ARUBA
10	STRATEGIC PARTNERSHIPS
16	RENEWABLES
20	INNOVATION
28	GREEN INITIATIVES
38	GREEN POLICY INCENTIVES

GREEN ARUBA

A platform for information exchange at an expert level.

Green Aruba conference was created in 2010 as a result of the vision of the Prime Minister of Aruba, Mike Eman, for a green and sustainable Aruba, where sun, wind and ocean are naturally abundant. Every year a platform is set for information exchange at an expert level. It is also the purpose that goals achieved from the previous year are showcased and new objectives set are communicated.

In 2012, at Rio+20, Aruba entered into a strategic partnership with Carbon War Room, the foundation established by Sir Richard Branson, to assist Aruba to 100% fossil fuel independence by the year 2020. That same year, Smart Community in Kibaima was also launched - a housing community consisting of 20 fully sustainable homes. The Government of Aruba and NV Elmar announced to allow distributed generation, thus allowing consumers to sell energy back to the grid. These milestones are setting the foundation for private businesses and consumers to contribute to alternative energy use and an increased sustainable present and future for Aruba.

In 2013 the Green Aruba Conference was presented jointly with the prestigious Caribbean Regional Energy Forum (CREF). With Green Aruba's 5th anniversary in October 2014,


it was fundamental to focus on the next steps to achieving Aruba's 2020 Vision. With this in mind, Green Aruba, for the first time, was merged with the Europe Meets the Americas Conference (EMA) to form GA-EMA 2014, attracting companies, government officials, and investors from Europe, Latin America and the larger Caribbean region. The focus was on sustainable solutions including energy, technology, infrastructure and tourism, and herewith building the Green Gateway.

In October 2015 Aruba will host its sixth annual Green Aruba Conference.

"Aruba is uniquely suited to try this alternative. And I think we will succeed. And it's not 'if' we will succeed, it's that we 'have' to succeed as there is not another alternative."

DR. EDWARD CHEUNG,
NASA AND MASTER OF CEREMONIES GREEN CONFERENCE ARUBA





“Aruba can become a shining example of a successful transformation to a low carbon economy and eliminate the use of all fossil fuels by the year 2020 – I believe we can develop what I would call ‘the Aruba way’: a new type of development, very inclusive in terms of community involvement, very forward thinking in terms of its objectives and its vision to a low carbon economy. And at the same time, very cutting edge with respect to technologies we have today to move in that direction.”

JOSE MARIA FIGUERES
PRESIDENT OF CARBON WAR ROOM



STRATEGIC PARTNERSHIPS

10

2020 vision

Aruba Green Deck

“If you want to go far, go together.”

UTILITIES ARUBA NV

The vision by stakeholders for a cleaner environment and a more sustainable way of living became the mission for the power and water production and distribution companies on the island. With this new vision, the challenging strategy of becoming increasingly independent of fossil fuels by seeking more efficiency on both supply and demand side while simultaneously introducing more renewable energy penetration became a reality. This was only made possible by adopting a framework where the balance between Reliability and Sustainability could be implemented while maintaining Affordability. This RAS framework seeks the right balance between Reliable and Sustainable investments in power production and distribution, but this balance can only be acquired if the Affordability of water and power tariffs is kept stable.

Last year the “MEI”, macro-economic impact component, was added to the RAS framework, to further enhance sustainability to the Aruban economy. Utilities Aruba continuously plays a key role in the transition towards the use of alternative energy sources and to reach Aruba’s sustainability goals. Utilities Aruba NV is a private 100% state-owned company that acts as the liaison between the stakeholders and its subsidiaries WEB Aruba NV and NV Elmar.

“To implement a green or renewable energy policy, we need to create momentum and awareness. It is not only wind turbines and solar panels, but it is a way of thinking as well.”

DR. FRANKLIN HOEVERTSZ
MANAGING DIRECTOR OF UTILITIES ARUBA NV





Caribbean Branch Office TNO A clean tech research center with test and certification facilities.

Since 2009 the Government of Aruba started to seek international partners to transform itself into a leading sustainable society. In implementing its national programs, Aruba benefits from its relationships with institutions from all over the world. TNO, a renowned not-for-profit organization for applied scientific research in the Netherlands established its Caribbean Branch Office in Aruba in 2011.

TNO has offices in Brussels, Qatar, Toronto and now in Aruba. TNO is also a flagship partnership for the Green Gateway, servicing the Caribbean, Central and South American region from its base in Aruba. TNO's Caribbean Branch in Aruba has not only been a central and instrumental part in Aruba's achievements thus far, but continues to take advantage of the nearly constant supply of sun, wind and waves in conducting testing and research of renewable energy technology. The center focuses on field lab facilities for solar and wind based energy systems and low energy water treatment systems (production and waste-to-energy). Moreover, it facilitates educational and training opportunities for Aruban residents, international students and professionals.

TNO has assisted Aruba in consolidating all its ongoing projects as well as to identify solid opportunities for the island. Aruba's energy transition is not only a technological design, but also the economic and societal aspects must be considered.

“Aruba is a breeding ground for sustainable innovations”

(LEFT) MART VAN BRACHT
MANAGING DIRECTOR AT TNO ENERGY



“TNO is looking for the balance according to the ‘Triple P’ Principle: PEOPLE, PLANET AND PROFIT.”

(RIGHT) JAN EBBING
DIRECTOR OF TNO CARIBBEAN BRANCH OFFICE

TNO has produced several crucial studies to aid us in gaining knowledge for sustainable progress:

- “Community Household Attitudes and Behaviors to Energy Efficiency Adoption”
- “Electrical Vehicles and the Reduction of Transport-Related CO₂-Emissions on Aruba”
- “Roadmap Smart Grid Aruba”
- “Saving Energy in the Government Buildings of Aruba, Assessment of the Short-term Solutions”



HARVARD
UNIVERSITY

Seven leading professors from Harvard University in the fields of business, science, engineering, ecology and public policy came to Aruba in 2012 to examine, in both broad and narrow terms, the status of Aruba's efforts on sustainable energy, the challenges and the plans for the future. The delegation from Harvard was led by Professor Daniel P. Schrag, Director, Harvard University Center for the Environment, and also included faculty members from other schools and departments, including the Harvard Business School and the John F. Kennedy School of Government. The goal of Aruba's partnership with Harvard is to explore creative sustainable solutions and approaches, not only for Aruba, but for the entire region.



The Government of Aruba signed a Memorandum of Agreement in 2014 with the University of the District of Columbia, specifically its College of Agriculture, Urban Sustainability and Environmental Sciences. The University will assist Aruba to create capacity-building skills and knowledge in support of food and water security on the Island. Among other things, the University of the District of Columbia will provide teaching, learning, demonstration projects and research in line with the environmental and sustainability goals of Aruba. In addition, it will offer opportunities for exchange students between Aruba and the United States, including opportunities for Aruban students to study aquaponics and hydroponics at the University's Muirkirk Research Farm located in Beltsville, Maryland.

CARBON WAR ROOM

The partnership would make Aruba the world's first sustainable energy economy, with the Government of Aruba and Carbon War Room working to devise an integrated strategy for the economy-wide transition – a world first, if successful. Carbon War Room accepted the challenge of the United Nations to take the lessons learned in Aruba and apply them in ten other island nations, so the “Aruba model” will be exported globally. The prestigious Rocky Mountain Institute has recently joined efforts with the Carbon War Room, and together these two well respected nonprofits dedicated to promoting renewable energy will be assisting the Government of Aruba to achieve its goal.

Carbon War Room's Smart Growth Pathway

The Smart Growth Pathways (SGP) document, produced by Carbon War Room in collaboration with Government of Aruba, WEB Aruba NV, NV Elmar, TNO and other key stakeholders, is an analysis of challenges and opportunities in Aruba's pathway to sustainability. The focus is on the energy sector and setting out a pathway for Aruba to economically achieve fossil fuel independence. Specifically, it sets out Aruba's course to achieving energy transition, presenting the challenges and the opportunities, with clear recommended actions to deliver solutions focused on driving investment into renewable projects.



For Aruba, energy transition is a moral responsibility and an economic opportunity.



“All of us at the Carbon War Room look forward to rolling our sleeves up and forging ahead with you on this incredible journey that will excite, inspire and demonstrate to the rest of the world that, together, we can and will solve the climate crisis, and in doing so we will open up the greatest economic opportunity of our generation, for future generations. **Ban Traha Hunto!”**

(BAHN TRAHA HOON-TOE is Papiamentu for “Lets work together!”)

SIR RICHARD BRANSON
FOUNDER CARBON WAR ROOM

Living a sustainable
life starts here, with us.







RENEWABLES

WINDFARM VADERPIET

With an actual capacity of 30MW, Aruba's current wind power production represents about 17% percent of its total consumption. But today, with a second wind farm to be deployed, Aruba is set to double its wind energy output.

“Aruba ranks number 4 in the world in its wind energy production, and after construction of the second wind farm, Aruba will rank number 1 in the world.”

MR. HENK HUTTING
DIRECTOR WIND PARK VADER PIET



“We have the first Waste to Power installation in the Caribbean and South America and after 4.5 years preparing and completing this process, we now hope to reap the benefits. We want to be an example for other countries in the region, putting sustainability on the agenda. Aruba can become a role model for the region.”

FREDDY KELKBOOM
MANAGING DIRECTOR OF ECOTECH AND ECOGAS

ECOGAS AND WEB ARUBA NV

Converting our Waste to Energy

In the first phase of the waste to energy project, 2MW will be produced, which is 2% of Aruba's electricity demand. Ecogas will convert a majority of EcoTech's collected waste into energy to be used by WEB Aruba NV. Ecogas is the first waste-to-energy company in the Caribbean and South America and will

operate to significantly reduce the waste problem on island. Recyclables will still be extracted from the waste and exported through its sister company EcoTech. In the future, the project hopes to use 70% of household waste and produce 7MW.



This milestone demonstrates the key role Aruba's free zone can play in developing Aruba as Green Gateway for the region.”

GREG PETERSON
DIRECTOR OF FREE ZONE ARUBA NV.

“We now have the potential to burn all household waste of Aruba and convert it into biogas.”

OSLIN BOEKHOUDT
MANAGING DIRECTOR OF WEB ARUBA NV



Reina Beatrix Airport

ARUBA'S 1ST SOLAR PARK

Various local and international companies are working together to construct Aruba's first solar park. The solar park will be the first sight that our visiting tourists will see upon landing and exiting our Reina Beatrix Airport. The park is under supervision of the local electricity company NV Elmar. The solar park will be operational in 2015.

14,000

solar panels will cover
the entire parking area

3.6 MW

installed capacity

500

homes powered at
peak performance

"The effect of the project is incredible. For example, the image alone that it will create in all of the Caribbean for a solar project of this magnitude relative to our tourism is exceptional.

Their first encounter with Aruba will be a Renewable Aruba."

ELTHON LAMPE
BUSINESS DEVELOPMENT OFFICER NV ELMAR



SCHOOL SOLAR PV PROJECT

The Government of Aruba together with Carbon War Room, TNO, Utilities Aruba NV, WEB Aruba NV and NV Elmar, jointly announced their latest renewable project to be tackled in 2015. Together, they will install an approximate 4MW of solar projects spread out over the island on school rooftops. This project will represent roughly another 1% of total energy demand with an effective production of approximately 6 hours per day.



NEW WINDFARM URIRAMA

Urirama Windfarm is expected to become operational in 2016. This second wind farm will have a capacity of 26.4MW, but due to its longer blades will be more efficient than the island's current wind farm, Vader Piet, and will ultimately be able to produce more energy.

URIRAMA

26.4
MW

VADERPIET

30
MW

Aruba boasts one of
the world's best locations
for wind power, with

5,000
HOURS OF WIND PER YEAR.

INNOVATION

WEB Aruba's Test Projects

Storage using Flywheel and Underwater Compressed Air Technology

Storage is the only solution to resolve intermittency production by wind and/or solar. With the exception of battery solutions, adequate affordable storage technology is not yet available. Even new and proven long-life battery technology does not meet Aruba's unique needs. In determining the right storage source for the island, reaction time is instrumental.

Flywheel technology was chosen as the best short-term solution, while for the longer term Aruba has so far opted for an as yet unproven method: underwater compressed air storage (UWCS).

By early 2015, flywheel technology will be operational, while the UWCS will become operational once power of the second windpark becomes available in 2016. Both projects will not only lay the ground for Aruba's storage needs, but also the effective deployment of the Uirama wind farm while reducing wind energy curtailment.

Combining storage with all of Aruba's efforts in other renewable solutions, the country's sustainable energy production will have risen to over 40 percent, another step closer to its ultimate goal of 100 percent.

"Envisioning green, clean and fuel oil free water and energy production by 2020, WEB Aruba is very happy with this innovative energy storage solution,"

OSLIN BOEKHOUDT
GENERAL MANAGER OF WEB ARUBA NV

/ATION

WEB Aruba's E-project

Educating students on the production of water and generation of renewable energy

Besides WEB's active participation in Green'S'cool, the company also launched its E-Project (Education-Project) in 2014 by providing modules for educators, developed with input by the same teachers, and tools necessary to educate our students on the production of water and generation of renewable energy. With 7 participating schools, the pilot will be running in the school year 2014/2015 and is incorporated in the curriculum.

Each of the E-project modules includes:

- an animated short film explaining each process
- a teacher's manual
- questions & assignments
- tools for practical assignments
- teacher support by WEB Aruba NV

WEB Aruba contributes in creating awareness for new technologies among the future generation.



Cutting Emissions and Cooling Energy Costs

Furthering our 2020 Vision, the Aruban government and Utilities Aruba unveiled a new cooling system at the main office building of WEB in 2014. The new installation harnesses cutting-edge technology to help deliver on the vision of a greener, lower-cost energy future for Aruba. Utilities Aruba believes that temperature management will also be crucial in cutting emissions and energy costs as cooling represents 50 percent of the energy demand.

"This project will apply mostly to our larger and industrial clients. We plan to use our headquarters as a model and later expand the use of this technology to help us shift power production from day to night."



Smart Community Aruba

State of the Art in Sustainable Living

Smart Community Aruba will become a residential neighborhood developed through a partnership of different Aruban and international partners. It will function as a sustainable energy island within Aruba. The key objective of Smart Community Aruba is to research and develop scalable technology solutions and business models to make the transition to a sustainable energy system a reality.



Smart Community

Design, Efficiency and Innovation at Home

Real life testing and demonstration is a must to move sustainable technologies from concept to practical application. TNO's Smart Community Aruba is a 20-unit residential neighborhood aimed at sustainable living. The key objective is knowledge development relating to scalable technology solutions and business models to help make Aruba's transition to sustainable energy a reality.

The aims are to:

- Experiment on supply and demand in harsh climatic conditions.
- Gain experience with the integration of renewable energy into the smart grid;
- Evaluate sustainable building techniques and efficiency measures;
- Manage water and waste issues efficiently and innovatively;
- Develop new energy service models and learn about consumer behavior;
- Create opportunities for private partners to showcase, test and certify: technology, building systems and design.

Aruba is also a challenging test environment due to the harsh climatic conditions including high wind speeds, high UV factor and salt corrosion. A successful performance on Aruba will therefore be a valuable product marketing reference.



Memorandum of Innovation - Aruba and Philips

Royal Philips, the global leader in lighting, and Aruba signed a Memorandum of Innovation, a strategic partnership to help the island of Aruba meet its goal of running on 100 percent sustainable energy by 2020, enabled by Philips' Indoor Lighting Innovation, Iconic Transformation and Sustainable Innovation. In support of the Aruba government's Smart Island Strategy for

sustainability, Philips will help revamp the island's entire public lighting system by completing an in depth assessment and providing solutions for public buildings and outdoor lighting systems. It will also transform Aruba into a showcase of innovation in the region.

Project Cycle "Indoor Lighting Innovation"

The Parties intend to work together to conduct a thorough diagnosis and prepare a solution design to transform public facilities to more sustainable and innovative infrastructures as well as to showcase the benefits of cutting energy consumption

PHILIPS'S ENERGY-EFFICIENT LIGHTING SYSTEMS COULD HELP ARUBA ACHIEVE

US \$1.2 - \$1.7
million

ENERGY COST SAVINGS PER YEAR

3,000-4,000
tons

LOWER ANNUAL CO2 EMISSIONS

Project Cycle "Iconic Transformation"

The Parties intend to cooperate to formulate the design and proposal for iconic sites that will beautify and enhance the attractiveness of Aruba that could trigger a social economic impact.

Project Cycle "Sustainable innovation"

Philips will undertake a mission on Aruba to identify programs to enhance Aruba's sustainability in line with Philips' own sustainability mission and programs such as Livable Cities, simply Healthy @ Schools, Recycling Best Practices and Lighting University Programs.

The Green Faculty

Innovating Aruba's Future Workforce

TNO in collaboration with Arizona State University successfully started the Green Faculty in 2012. The Green Faculty offers trainings in support of Aruba's sustainable energy transition. Aruba realizes that in addition to technological innovation, local capacity building is of key importance. The first trainings focused on increasing know-how in the area of solar power. Linked to this training program, collaboration has been developed with the local technical college, Colegio EPI. The solar training lab is located on its campus. This created the opportunity to use this facility to train the next generation of solar installers. An intensive one week engineering and installation training continues to be offered on a regular basis and is marketed to professionals throughout Caribbean region.

To achieve its ambitious goals in transitioning off fossil fuels, Aruba will need a workforce that has the skill and capacity to make this a reality. To address this need, the University of Aruba, since TNO's launch of the Green Faculty in 2012 and in partnership with the TNO's Caribbean Branch Office with the support of the Government, has since increased educational opportunities for sustainable technology on the island. In cooperation with US and European partners and universities, Aruba's Green Center of Excellence plans to offer a Bachelor Degree on Environment, Energy and Entrepreneurship moving forward.

University of Aruba and CBOT are proud to present the following Sustainable Island Solutions program offerings. These are in response to needs identified through stakeholders meetings and interview with partners in Aruba.

2015 And Beyond

Summer School

Short Time (10-15 days)
Academic courses + fieldwork

Winter School

Short Time (5 days)
Limited courses - Executive

Professional Development Certificates: PDC's

Medium Term (2-3 months)
Courses on specific topics

2+2 Bachelor

2 yr Aruba + 2 yr abroad
Full Bachelor program

Summer School

Goal: Provide a 2-3 week academic program, in cooperation with partner institutions. Courses and fieldwork related to Sustainable development and green technology, 3EC's.

Target: Local and international students.

Time: 2nd half May - 1st week June 2015

Price: US\$ tbd

Winter School

Goal: Provide a short 5 day intense insight into managing and creating a sustainable business and business practices.

Target: Local and International managers and executives from private and public sector.

Time: December 2014

Price US\$ 1,500.00

Professional Development

Certificates: PDC's

Goal: Provide a 2-3 month program to enhance the knowledge and skills of professionals active in the field of green technology and sustainable development.

Target: Local professionals from private and public sector.

Time: 2015

Price: US\$ 1,000.00

2+2 Bachelor

Goal: Provide a Bachelor degree in different area's of Green Technology and Business Development. 2 years on Aruba and 2 years at a partner institute.

Target: Local and International students

Time: Start 2015-2016

Price US\$ 750.00 standard tuition per year for year 1 & 2.

GREEN'S'COOL

Aruba's Social Transition to a Sustainable Future

26

2020 vision

Aruba Green Deck

The “Green'S'Cool” Program in 2012 to make Aruban schools more energy efficient, sustainable and economically independent by involving and empowering students to become more aware of the environment. The project originally began with workshops and a fun competition to encourage students to make their schools more energy efficient. It allowed participation of public and private companies, which also benefited from the practical and interesting solutions the students developed for their schools.

Green'S'cool has since been developing into an entire national program tackling various segments of the population with tailored projects to encourage a sustainable lifestyle. It is the vision of Green'S'cool to be the heart for a social platform connecting, engaging and integrating all sustainability innovations in Aruba, where community, industry, public sector and NGOs collaborate for a sustainable Aruba. The goals are to positively influence Aruba's social adoption rates through targeted markets, to develop ‘How-To’ Toolkits for target markets, to measure the progress, to document the Best Practices, and to export our knowledge to other small island states and/or countries.





GREEN INITIATIVES



A close-up, low-angle shot of a middle-aged man with a mustache, wearing a bright blue hard hat and a white button-down shirt. He is smiling warmly at the camera. He is holding a large, modern LED street light fixture, which is partially visible on the left and bottom of the frame. The background is a bright, overexposed outdoor setting.

The LED Roadway of Aruba

Canadian company LED Roadway is lighting up the roadways of the world. The LED street lighting project, together with NV Elmar, the local electricity distributor company, will begin in 2015 and is expected to have completed the instalment of 12,000 smart light fixtures

within two years with an expected energy savings of 50-70 percent. Moreover, the maintenance costs are much lower with the 20-year lifespan of the LED lights further producing indirect savings for the community.

Benefits

The ability to control light levels

The ability to extract key information

Solutions can be applied in a wide range of locations



Hunto Nos Ta Spaar – Together We Save!

Promoting sustainability through energy efficiency.

Hunto Nos ta Spaar is an awareness program designed for the community and executed in a collaborative form by the Government of Aruba, Utilities Aruba NV, WEB Aruba NV, NV Elmar, and many partners in the private sector. The aim was to, in a practical form, encourage the use of energy- and water- saving products in households.

With 120 students from our local technical institute EPI, home-to-home visits were made with a 'goodie' bag containing energy-efficient lightbulbs, kitchen- and bathroom aerators, toilet water-saving tools, toilet dye for leak detection, and thermometers for refrigerators and room temperature control. The highly successful awareness campaign covered 10,000 homes out of the 35,000 households in Aruba and will continue with its efforts in the future.



Prepaid Meters

NV Elmar's tool to aid in promoting consumption awareness.

To continue to build on the energy efficiency efforts Aruba has been undertaking, NV Elmar, the local electricity distributor, has been moving towards a more service-oriented business model. In 2012 the company expanded their services by offering their customers the choice to a prepaid meter. In order to promote sustainability awareness, this service is an important part in that it provides a tool to aid in consumption mindfulness. Research shows that the market has not only accepted this new service, but households having adopted the new service have also become conscious of their energy consumption.





Smart Metering and the Smart Grid

Pre-paid meters were launched and their dispersion will continue as NV Elmar introduces their latest initiative, the smart meter project. Smart grid and smart metering will be the focus for further penetration of renewables to the grid while also engaging more in demand-side management.

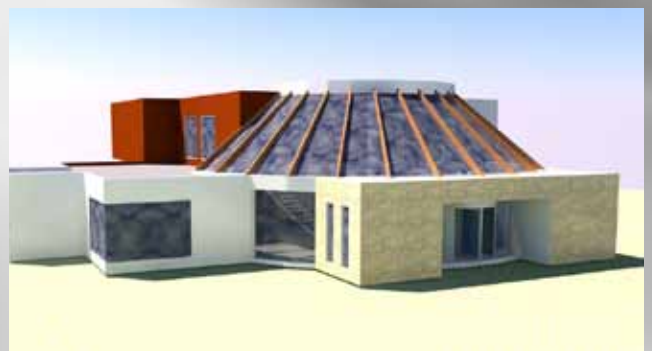
The key principle of a smart grid would be the possibility of having some control of the demand of consumers. This will

allow the power supplier to operate its power production more efficiently, gaining on production costs, and ultimately also increasing reliability. The strategy for success will be making the customer aware of the advantages and therefore a strong and continuous marketing campaign will follow to secure effective penetration.




Multifunctional Public Service Offices

The Government of Aruba is building five multifunctional accommodations to centralize its services to its citizens and ultimately to create more cohesion in the community. Each of these new locations will be fitted with solar panels and the public gardens will be maintained using the recycled water from the air-conditioning units. The development of these public service offices is part of a comprehensive plan to become a one-stop shop of sorts for the neighboring community offering a variety of services including payment of utility bills, general health insurance services, using the facilities of the on-site public library, enjoying the coffee shop, or practicing art in the atelier space. All locations will offer Wi-Fi hotspots open to the public.



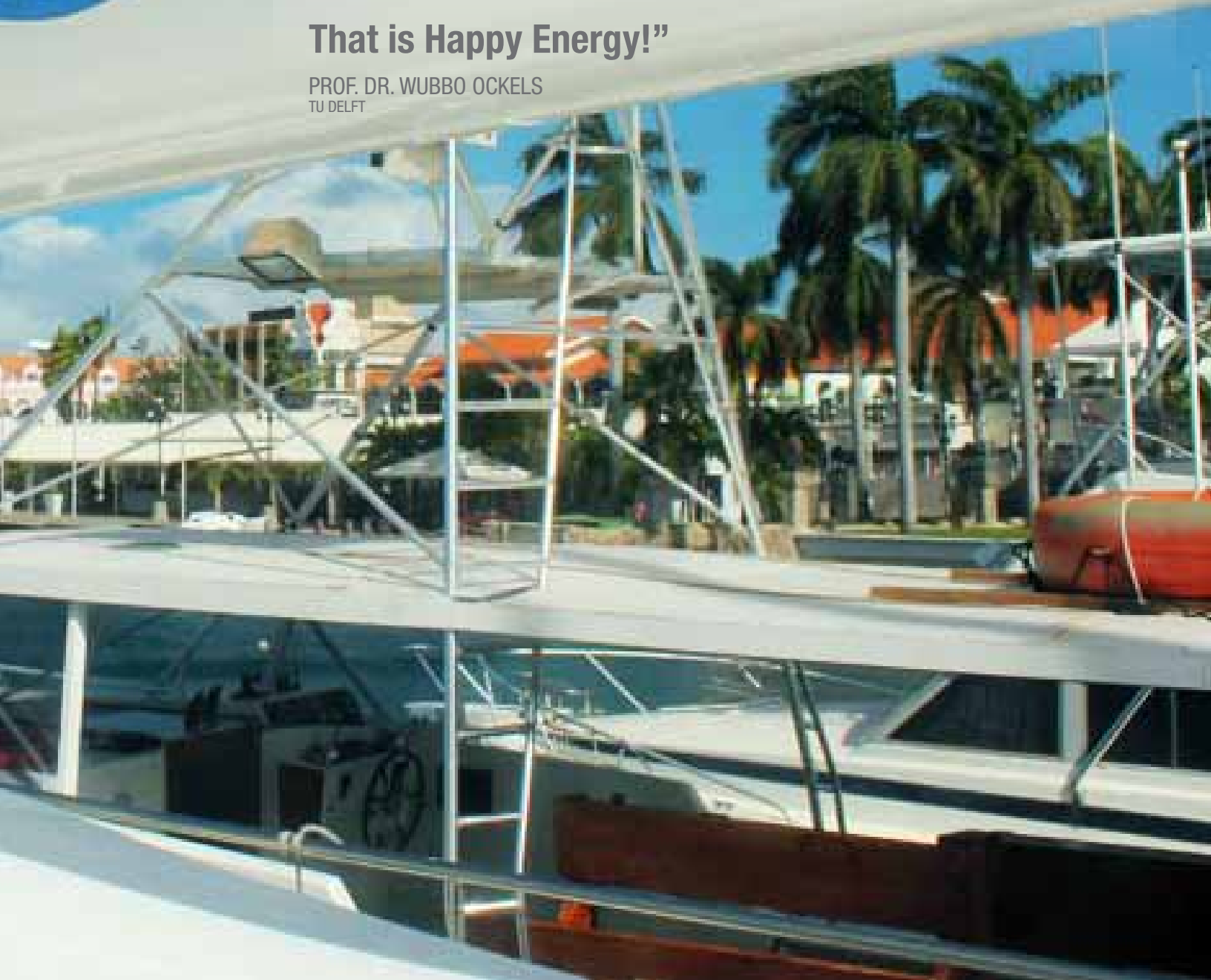




"I want to explain to people the urgency of the situation based on my experience in space. Space is an emptiness. Space is a threat to life and our earth. Everything that we value and love on earth is only protected by a very thin layer of air, which is hardly visible. When you walk outside you do not even realize that there is a danger above you. You have to bless the air that is protecting you. And instead we pump all sorts of junk in the air. Are we stupid? We are all astronauts of planet earth, and I want everyone to feel that in their hearts. We have to live for life. Life is so pleasurable, so beautiful. I'm going to take that road to sustainability and I think everyone should too. Less forza, more sustainability. Everyone can do it! Maybe only a little, but everyone can do it! And when you do it, you feel something called Happy Energy. And it comes from a little gene within us that tells us that humans will survive.

That is Happy Energy!"

PROF. DR. WUBBO OCKELS
TU DELFT





At bucuti & Tara beach resort

All guests are given a free water canteen to refill with water.



At bucuti & Tara beach resort

there are Solar Panels on roofs to heat the water for their guests.

Sustainable Tourism

Aruba currently is seeing a trend in its hotels focusing on sustainability and adopting energy efficiency measures on their properties. The front-runner in this area is the innovative Bucuti & Tara Beach Resorts with many certifications and awards for their best practices. However, other hotels are also breaking way, for example Divi Resorts Aruba with various properties on island as well as the Hyatt Regency Aruba Resort & Casino with their rooftop solar installation and La Cabana with their employee recycling programs.



At bucuti & Tara beach resort

there is a consistent participation of hotel guests in their monthly beach clean ups.

Solar Panels at the YMCA, San Nicolas

The YMCA in San Nicolas, hosting daily over 90 children after school, inaugurated their building retrofitted with solar panels. With the support of Aruba Way Foundation of Valero, the roof of the building was fully renovated before installing the solar panels. Additionally, the basketball court was renovated as was the computer room, the fencing, and the playground. YMCA San Nicolas also has inverter air-conditioning units installed in its facilities. Since the implementation of the new renewable energy technologies, YMCA has also seen a consistent and meaningful reduction in their energy consumption.



Solar Panel Installation

at Elderly Home Paviljoen St. Michael

Sustainable energy for the wellbeing of our elderly

St Michael Paviljoen is an elderly home with 42 senior citizens residents. With the support of Prime Minister Eman, Pfixx Solar NL donated solar panels of 20kWp and four 5kWp solar inverters, a value of approximately US \$45,000, to provide electricity for the cooling units in the living area of St. Michael Paviljoen. This system will produce 3000 kWh monthly equaling a contribution of over US \$800 in electricity for the same period, ample to operate the cooling system daily and herewith securing the energy needed for the improved quality of life of the elderly residing in this home for the coming 25 years.



Private green initiatives

Aruba currently has four companies active in solar panel installations on Aruba, three of which are new companies that have established in the period since Aruba's 2020 Vision was born. With the grid policy changes that took place in 2013, the market has steadily seen a healthy growth rate since.





GREEN POLICY INCENTIVES



ARUBA'S GRID POLICY BY ARUBA ELMAR NV

Up until 2012, the Aruban people only knew about power coming from the utility companies. Convincing them they could switch to their own power supply and at the same time sell the surplus to ELMAR has not been easy. They were a little reluctant and hesitant. We are now close to 1 MW installed capacity of solar and we expect this to increase, although cost is still a barrier to residential solar.

At Green Aruba (GA) III, director of NV Elmar, the local electricity distribution company, launched its new grid policy during his presentation. The company introduced the possibility for residential properties to produce 10kWp for an approximate monthly production of 1,500kWp to sell the surplus back to the company. For commercial properties, the production of 100kWp for an approximate monthly production of 15,000kWp is encouraged through the newly introduced grid policy.

PROMOTING ELECTRIC DRIVING

In 2011, as an additional incentive to promote sustainable growth toward 2020 Vision, the Government of Aruba introduced tariff reductions on import of electric cars from 40% to 2% to include parts. Moreover, the Government of Aruba also reduced the import tariffs for Hybrid vehicles to 12%. Lastly, the government cut road taxes for electric vehicles and hybrids to US \$42.86 and US \$85.71, respectively.

In 2014 Aruba introduced the 1st Fast Charging Station Level 3 in the Caribbean



38%

TARIF REDUCTION
ON ELECTIC CARS



2%

IMPORT TARIFF
ON THE FOLLOWING

INVERTER ELECTRONICS
WITH ENERGY STAR LABEL

WHITE GOODS
WITH ENERGY STAR LABEL

COMPACT
FLUORESCENT LIGHTBULBS

SOLAR
POWERED WATER HEATERS

SOLAR PANELS

LED LIGHTS

WINDMILLS

Energy Efficient PRODUCTS

Additional incentives supporting the 2020 Vision are the tariff reductions on the import of all green products in the broadest sense, from solar panels and windmills to biodegradable cleaning agents, and from inverter air-conditioning units to LED lights.





UTILITIES ARUBA^{NV}



Government *of* Aruba
Ministry of General Affairs, Science,
Innovation and Sustainable Development



Government *of* Aruba
Ministry of Economic Affairs,
Communication, Energy and Environment