«PlanetSolar» expedition report 2004-2012

The first around the world with solar energy

Around the world expedition, from Monaco on 27.09.2010 to Monaco on 04.05.2012

Author: Founder and Expedition leader. Raphael Domjan MI'11

Date: May 14, 2013, Neuchâtel, Switzerland

Flags: 71#

Honours: Prix solaire Suisse 2012

MS PlanetSolar arrives in Miami (USA)

Vessel MS Turanor PlanetSolar
Architect: Craig Loomes, Auckland, New Zealand
Builder: Knierim-Yachtbau, Kiel, Germany
Certifications: GL (Germanischer Lloyd, Germany)
Flag: Switzerland, Basel
Owner: Rivendell AG, Mr. Immo Stroëher
Manager: PlanetSolar SA, Yverdon-les-Bains, Switzerland

Technical features:
Electro-solar propelled catamaran.
Propulsion by two VOITH variable pitch propellers.
Built with composite materials, carbon and foam.
Solar cells: Sunpower C65,efficiency 22,6 %, modules 18,8%.
Surface: 537 sq.m 93,6kW Pc.
Capacity of batteries: 1'200kW/h (available 1'000kW/h), equivalent to 13 tons of Lithium-ion batteries, symmetrically placed inside the two floats (HDW Gaya technology).

Size and weight:
Without solar panels: length 31m, width 16m
With solar panels unfolded: length 35m, width 26m
Height above waterline: 6,5m
Draught: 2,2m (Rudder)
Weight empty: 102 tons
Weight in expedition mode: 105 tons

Performance:
Production record: 661kW/h in one day (May 3, 2012)
Average speed: 5 knots with around 20kW (27HP)
Maximum speed: 9 knots with around 90kW (125HP)
Maximum measured speed (bottom): 11,7 knots, approaching Singapore

Accommodation:
2 cabins with bathroom (shower and WC) (Expedition leader and captain)
4 standard cabins
1 shower, 1 shared WC
Fully equipped kitchen, gas stove (only not solar equipment)
Sea water desalinator, with a 500 liters fresh water tank

Communication and safety

2 VHF on board, AIS, BLU (Voice and Data), Radar, FLIR Camera, 1 Iridium and 1 Inmarsat 250 fixed Voice and DATA.

ADRENA navigation software with cartography and meteorology suited to solar routing.

1 EPIRB emergency beacon, two Iridium cellular phones, 2 vikings equipped (1x6p, 1x8p), rescue material, special emergency backpack and automatic defibrillator.

Records: [# «validated by the guiness world record»]

Biggest solar boat of the world. [#]

Fastest crossing of the Atlantic on a solar boat. [#]

Longest distance covered by a solar boat. [#]

Longest distance covered by an electro-solar vehicle (60'023 km)

First-time-ever exploits: [@ «validated by UIM (Union International Motonautique)»]

First solar boat world tour [#, @]

First world tour by a solar vehicle of any kind [#,@]

First crossing of the China Sea by a solar boat [#]

First crossing of the Indian Ocean by a solar boat [#]

First crossing of the Red Sea by a solar boat

First solar intercontinental crossing through the Panama Canal

First crossing of the Suez Canal by a solar boat

Introduction:

Outset of the idea.

In 2001, with a friend and my brother Alexis, we have been first to offer 100% solar hosting of internet and e-mail sites using energy produced by our own solar power plant. In 2002, during a national solar exhibition in Switzerland, I have the chance to sail, for the first time, on a solar boat. These two experiences allow me to realize that that we have all we need to change and become sustainable.

In September 2004, while I am in Iceland, I look for a glacier I had visited in 1993. Once on place, I realize that the glacier has almost disappeared, has moved several kilometers backwards and has lost hundreds of meters of thickness. Watching this apocalyptical view, reality of climate changes becomes evident to me. Persuaded that we have all we need to change and become sustainable, the idea of a world tour on a solar boat has appeared to me as natural.

Feasibility study:

To assess if a world tour on a solar boat is possible, an engineering school (HEIG-VD) and a solar boat building company (MW-Line SA) are mandated to define feasibility, routes and to imagine the design of a boat for such an adventure.

There are two possible routes i.e., go south (Cape of Good Hope, Cape Horn), or follow the Equator through the canals of Panama and Suez.

First results:

It comes out that the south route is not practicable based on today's knowledge. Instead, the route along the Equator remains difficult but possible. This first study also highlights the east to west direction of our journey, to profit of currents and down winds in the Atlantic and the Pacific oceans.

It allows to define size and necessary performances of the boat to come. 30 meters long, 180 square meters of solar panels and an expected average day and night speed of 10 knots. These sizes are impressive and no solar boat this big has ever been built. These figures also give us a first hint of the budget. Since 2006, a budget of 20 million Swiss francs appears to be the minimum amount required to accomplish in good conditions this expedition. That means 10 millions for the boat and 10 millions to organize the whole adventure.

Route:

To profit of trade winds and favorable currents in the Atlantic and the Pacific Oceans, the east to west direction of the world tour rapidly becomes evident. We mandate teams of MétéoFrance that will become a partner, to complete a preliminary study of our journey. We realize that, to complete our world tour in less than a year, minimum speed must be 8 knots: below than that, meteorological windows are no longer aligned. In fact, we must leave the Mediterranean between early springs and mid autumn and return during the same period, cross the Atlantic with trade winds out of the tropical storms period, same for the Pacific Ocean, and avoid the monsoon period in the Indian Ocean.

Two periods seem possible.

Option A:
Leave in spring, that is early March, and return the following spring.

Option B:
Leave in autumn and return the following summer or, if conditions do not allow, return in spring the following year.

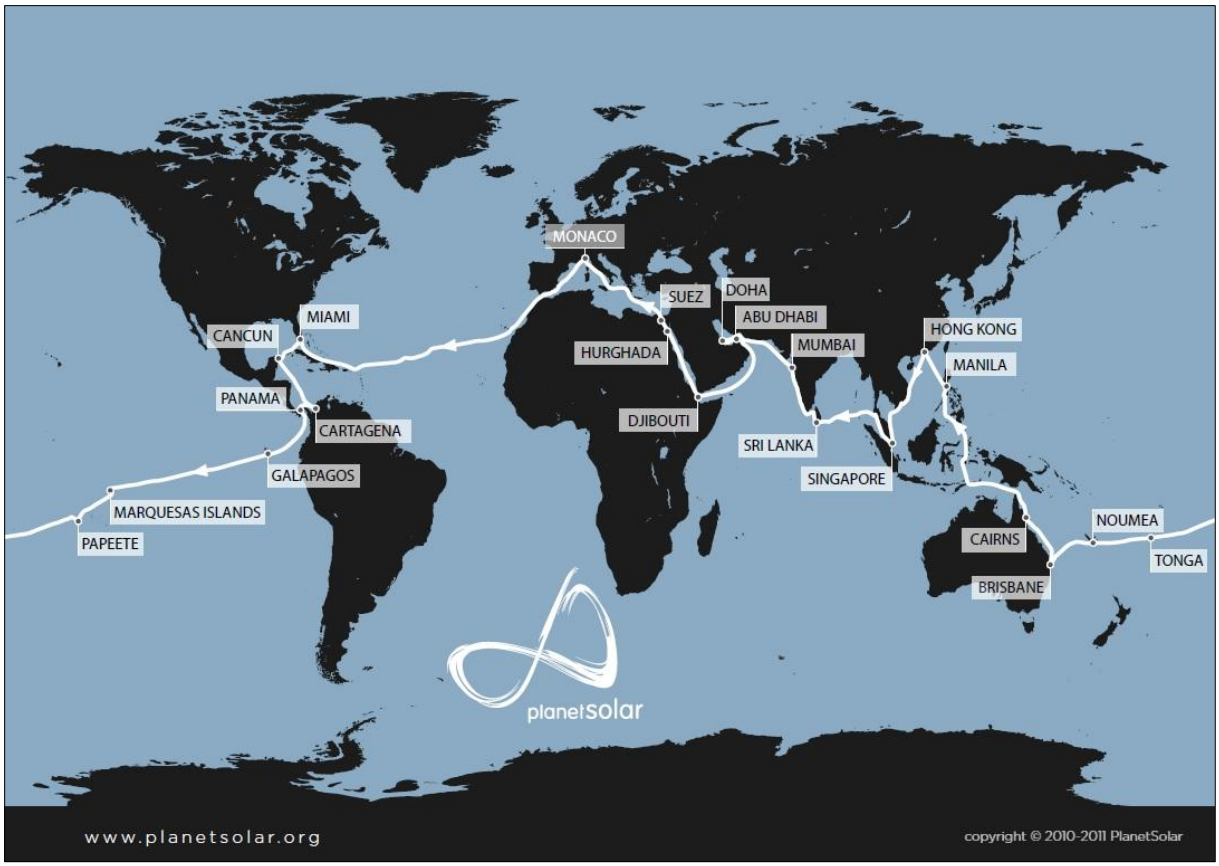
For a long time we had planned to leave early April 2010, but delay in the construction of PlanetSolar obliges us to postpone the date to April 2011. But we then realize that leaving in September could be possible. Moreover, some competitors want to copy our idea and try to overtake us. We therefore decide to try to leave in September 2010. We plan routes and stops so to be in Cancun, Mexico, early in December 2010, at the time of the United Nations conference on climate changes.

We decide to comply with the most severe rules on world tours: we must, therefore, leave from and return to the same place, cross all longitude lines, pass twice the Equator and reach the antipodes of our route. And all that, of course, only thanks to the energy produced by our own solar panels during our journey around the world.

In agreement with UIM, we leave Monaco, with 92% of energy in our batteries but we must have at least 93% in our batteries when we return at the moment we cross the arrival line. We will cross the arrival line - identical to the departure line – on May 5, 2012 at Monaco with 95% of energy in our accumulators.

To achieve this first-time-ever exploit, we have received support from Météo France teams in Toulouse for the preliminary studies and for the development of our solar routing software (See next chapter). But we also have received support from weather forecasters during our world tour, and that 24/24hours 7/7days. They have greatly contributed to the success of this first-time-ever exploit.

The PlanetSolar journey around the world, 27.10.2012- May 4, 2012



Panama channel, January 2011

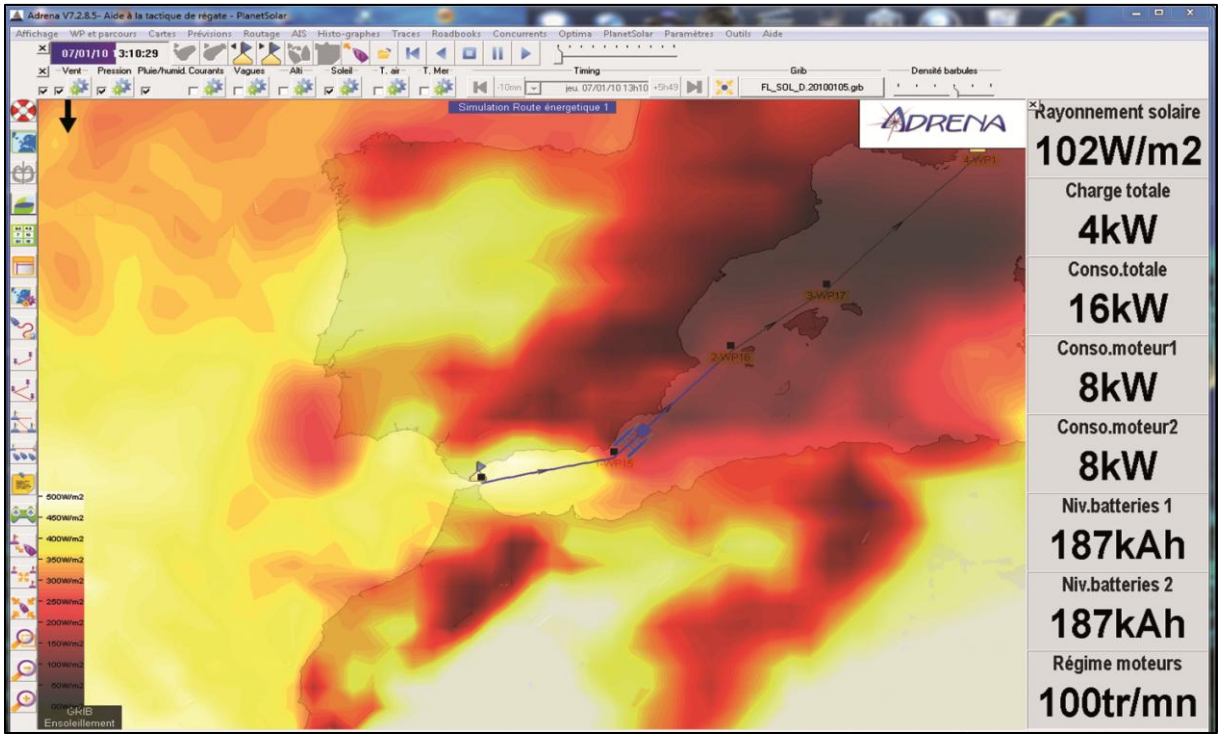
Routing:

A solar boat is a mechanically propelled boat, driven by electric motors operated by electricity provided by solar energy (on PlanetSolar, by photovoltaic solar cells). As on a sailboat, we must take into account all weather parameters, winds, currents, waves. But, on PlanetSolar, we must also take into account insulation and night and day cycles.

No one before us had ever tried such a journey. Essential element to succeed was the boat, but not alone: we also needed a tool to easily display insolation forecasts, on one hand, but also to have a software suggesting best routes based on meteorogical parameters, boat performances and battery levels.

My encounter with Michel Rodet, a passionate of sailing, will allow us, with help from the school of engineering of Yverdon-les-Bains and Pascal Goulpié, scientific coordinator of PlanetSolar, to develop the first solar navigation software of the world. This software will be a precious and vital aid during our expedition.

Insolation routing chart on Adrena software



Expedition: Monaco-Monaco (27.10.2010-04.05.2012)

Sailing from Kiel to Monaco, and departure:

We must leave the Mediterranean before end of September, and departure date also must be set early enough to allow a good planning of the event. As usual when a boat is built, but also with this shipyard, we are late. Finally, shipyard Naval will convoy PlanetSolar from Kiel to Barcelona. Early August, PlanetSolar leaves Kiel to reach Barcelona. On board, we have a member of our team, Christian Ochsenbein, our electric systems engineer who has to understand with Thomas, project manager at Drivetek, all the boat's electric systems. Jens Langwasser, project manager at Knierim is also on board; he will remain on board and will become our reliable Quartermaster. Stefen Muller, one of the responsible of the shipyard, takes command of the vessel, although he has almost no academic sea experience and only a Yachtmaster Coastal... They will sail from Kiel to Barcelona, mainly using the two working standby generators. This displacement – in which we do not take part – will not help us to tune-up. However, they will arrive, end of August as planned, at Barcelona. There, Patrick Marchesseau, who will be captain of the first part of the world tour, and myself get on board. This, to let us sail before the grand departure and to complete the preparation of the world tour. This navigation, only two days long, allows us to quickly realize that the boat will not meet the performances promised by the builder, we will later discover that we have been deceived on weight and performances of PlanetSolar.

On September 27, 2010 we are ready to try to accomplish this first journey around the world on a solar boat. We take on board two more crew members to cross the Atlantic.
Departure from Monaco takes place early in the afternoon at 14h00 (12H00UTC), our batteries are almost completely charged (92%) we have voluntarily avoided to charge them at maximum capacity because we must return from our journey with at least the same amount of energy. Since we suppose that our batteries will loose efficiency as we go along in our journey, we decide to be cautious. Caution, moreover, will be our philosophy during all the journey. Since at each new departure we left to new unknowns: new seas, new ocean, new weather conditions, new season and each time we learned to use our boat even better, our caution never developed into temerarity but into experience. After a moving goodbye to our families, friends and partners, the departure folds out under good weather conditions. But the two Météo-France forecasters, who moved to Monaco, have warned us that crossing the Gulf of Lion will be difficult. Mistral, strong well-known local wind, will raise during the night.

Passing Gibraltar and crossing the Atlantic:

We sail along the coast to stay sheltered from the wind, that raises as forecast; on the 29 we are in rough sea, under clouds and 50 knot wind gusts. We break a VHF aerial. It's the baptism by fire of boat and crew. But all goes well and we reach the small Spanish island of Tabarca to find shelter. So, our first test is a success. But it's there that, diving to check the hulls, I break a tooth and I have to return back home in Switzerland to see a doctor. In

Gibraltar, we receive a back-up battery to allow possible reparations during the world tour, in fact, later it will be almost impossible to rapidly receive a Lithium-ion battery, components of which cannot be carried by plane. In Tangier - PlanetSolar is a Swiss boat but built in Germany - we make a short stop to officially take the boat out of the European Community. We will try to sail to Las Palmas but, because of uncertain conditions, Patrick prefers to steer back to Tangier and wait for better conditions. For the first time, we assess the limits of our boat and what a journey around the world on a solar boat is: a continuous reckoning with the balance between the estimate of energy production in the following days and energy consumption necessary to cover the leg of the journey.
We stop a few days in Las Palmas, last preparation before crossing the Atlantic, we must reach Miami, 6'400 km far away. More than a month of sailing, during which we will be on the tracks of SUN21, the first solar boat (also Swiss) to cross the Atlantic in 2007. We have bottled a ton of fresh water, in fact for safety reasons we do not drink water from our tank. We have vegetables and fresh fruit for a week, and food for almost a month. We also have, for 6 persons for a month, a reserve of lyophilized food.
Besides this lyophilized food, we have secured several important points of our expedition.
Obviously, since the boat is certified, we have all mandatory communication equipment for a journey around the world. But nevertheless I have also carried on board some diving material, that will be useful more than once. A doctor, my friend Dr Patrick Schoettker, can be reached and is easily available from Switzerland in case of accident or illness. I have personally prepared with him an "expedition" first-aid bag that will also prove to be very helpful.
Crossing the Atlantic early in the season exposes us to tropical storms. First half of the crossing proceeds under good conditions and lets us attain the pretty nice average speed of more than 5 knots. We keep a very north route, almost the orthodromic one, between Las Palmas and Miami, but tropical storm "Thomas", that shows up later, bars our route. We have to modify significantly our journey and to steer southwards to avoid these adverse conditions. Approaching the Caribbean Sea, we get close to Saint-Martin and we decide to make a quick stop to validate the record of the fastest crossing of the Atlantic on a solar boat, in fact we are two days ahead of the SUN21 crossing made in 28 days.

Four hours later, just the time to validate our record at a notary office, we head to Miami where we will arrive on 27.11.2010.
Arriving in Florida is a significant step: despite the inferior performances of the boat, we have successfully achieved a symbolic event: crossing the Atlantic without fossil fuel, with no other propelling means than energy produced by the sun.

Leaving Miami, after a short two days stop, where we have organised a nice stay with our partners and sponsors, we take on board Gauthier Toulemonde who will be in charge of mailing our adventure. We have in fact more than 2000 postcards onboard, they will complete the journey around the world with us and will get a postmark on each continent. They will then return to their owner or will be sold in the years to come to support the PlanetSolar foundation.

In the Gulf of Florida, we fight against a strong adverse current that forces us to stay by the coast of Cuba. Off the coast of Havana, Cuban coast guards stop us. But an hour later they finally let us continue our route. We arrive as planned at Cancun, Mexico, where we are waited for the United Nations conference on climate changes. Unfortunately, we should have reached the front of the hotel where the conference was taking place, but water was not deep enough for our solar vessel. We will not get the exposure to media we wished, but our presence is anyways a nice and positive message.

We then head to South America, we arrive at Cartagena, in Colombia, a few days before Christmas. Before we engage in the crossing of the Pacific, we take two weeks of vacation.…

Crossing the Panama Canal and the Pacific Ocean:

Early January, we leave South America to reach Colon, the entry to the Panama Canal on the Atlantic side. We take on board Immo Stroeher who comes to take part with us in this first-time-ever exploit. Incredible to cross this canal, to be at the Gatun Lake, in the middle of the tropical forest on the biggest solar boat of the world.... We glide without a noise through the mountains of Panama and, after the descent of the Miraflores Locks we find ourselves for the first time in the Pacific Ocean ... whaooo

An 18'000km crossing waits for us before we reach Australia, our first destination are the Galápagos. A short navigation of 1'800 km, during which we must rub against difficult weather conditions and very uncertain weather forecasts. Half way, we cross a zone of rubbish 300 km long and there, at the end of the afternoon, we see a tortoise caught in a life belt. We decide to get into the water. What a feeling, being able to free her and watch her dive free!

In Galápagos, we organize several conferences and visits with the help of the WWF. We also take care of a minor repair to our port side propeller. But the technician sent on place cannot replace the part. At the end we must pull out one of our engines in open sea and complete a very careful operation. But thanks to the local community, the operation is successful. We can repair and move on to French Polynesia. More than once, during our journey, we will benefit of enthusiastic help as here in the Galápagos. Because our unique expedition is close to people and carries a positive message for generations to come. People truly adhere to it and like to show it off with enthusiasm offering us their help.
The Galápagos islands are strongly protected by the government of Ecuador. Our passage has definitely called attention to the advantages of an electric-solar boat in a region where nature and wild-life are protected.

The crossing from the Galápagos to the Marquesas Islands, on the tracks of the Kon-Toki expedition is made without difficulties. Moderate trace winds, favorable current, strong sun let us complete this 6'000km navigation in 28 days, without a hint of human life (neither ship nor plane). Crossing the Pacific Ocean on a solar boat is a really magical experience. At day

we charge our batteries thanks to our star the sun and at night, we sail, heads in the Milky Way where every minute a falling star drops in front of our horizon.

We pass through the Marquesas, Rangiroa, Papeete, Bora-Bora and at each stop hundreds of people come to meet us... We will even have the chance of having Polynesian dancers on board.

Leaving Bora-Bora and heading for Tonga, some 100 miles west of Bora, the variable pitch system of our port side propeller breaks down. The blades feather and damage the skirt of the float. We have a leak. We have to dive several times to cut the skirt of the float and make a quick fix. We drift 12 hours before being able to sail again to Bora Bora on our own means. It will take two weeks and a technician rushed on place to repair.

After a short stop in Tonga, we head to Nouméa where we will change the captain, Erwann le Rouzic replaces Patrick who returns to France. Also the famous French photographer Philip Plisson arrives to take pictures of PlanetSolar in this corner of Paradise. Then comes the passage at the antipodes of our route, off Australia where we arrive early June at Brisbane. The Pacific has been crossed; a thought goes to our sponsor Kenichie Horie, who was the first to cross the Pacific Ocean on a solar boat in 1996, from Ecuador to Japan.

Sailing up Australia and crossing the Indian Ocean:

We move up the coasts of Australia, sailing along the barrier reef, we make a short stop at Lady Elliot Island, then we spend a few days in Cairns were we make some reparations. We change in particular, our desalinator. Then a long and difficult navigation waits for us. We have to pass the tricky Torres Strait and, moreover, we enter the most dangerous zones to navigate in, in terms security. That will be good for us, bringing us a precious experience to organize the crossing of the Gulf of Aden.

We stop in Manila, where our official partner Sunpower, manufacturer of our solar cells has its plants. Then we cross the China Sea to stop in Hong-Kong, in China, where for the first time we install the PlanetSolar village to share our adventure with as many people as possible. The PlanetSolar adventure excites children that discover the PlanetSolar village and can see the boat at the wharf nearby.
Solar energy is not just a fancy idea, it is an actual alternative: MS Turanor PlanetSolar has arrived here, at Hong-Kong, and has covered 20000 nautical miles by solar energy only.
Then we reach NhaTrang in Vietnam, where we must face contrary currents and headwinds to reach Malaysia. The favorable meteorological route runs through too dangerous zones, where pirates rage. We will have to beat along the coast of Vietnam, among fishermen and drifting fishing nets... Crossing the Gulf of Thailand is dangerous but now we know well our solar vessel. Early September we reach Singapore.

After a week of events in a big shopping mall, where part of the PlanetSolar village is installed, we carry out the maintenance of MS Turanor PlanetSolar. We have to remake the hull, repair a cutwater propeller and check all over before we engage in the dangerous adventure of crossing the Gulf of Aden.
We start leaving Singapore and we head to Thailand.
After a stop in Phuket, we make a rescue in the Gulf of Bengala. 250 miles off Sri Lanka, we help a boat of fishermen who had no more fresh water on board. It is probably the first rescue by a solar vehicle.

In Sri Lanka, as often during this journey around the world, TV crews climb on board to report our adventure. This will be still another opportunity to show the flexibility of our solar boat in coastal navigation. But when we sail up the coasts of India, we have to seek shelter at Goa. Again, a tropical storm bars our route. We stay close to the coasts, this time not because of the wind but because of the pirates. Crossing the Hormuz Strait is made under high tension. We are happy to reach Doha in Qatar to spend our second Christmas of the journey around the world.

This early 2012, we have an appointment in Abu-Dhabi to be present at the summit on the energies of the future. Managers of all over the world are present, and my friend Bertrand Piccard is also present and takes a few minutes to come visit PlanetSolar.

We had to reach Dubaï, but again our propelling system breaks down. It is almost the same problem this time wind pushes us against the coast, we cast the anchor at less than 500 meters from the rocks. It will take 17 hours to regain control of the situation and to reach by our own means Marina of Abu-Dhabi.

We will remain in Abu-Dhabi, to organize the final repairs and the protection of PlanetSolar in view of the crossing of the Gulf of Aden (GOA). We provide PlanetSolar with barbed wire on the struts and around the harbor. Moreover, we will have 6 soldiers, who belonged to special operations forces of the French Army, on board, armed with assault rifles. We will wear bullet-proof jackets and helmets. Our CSO, Christophe Keckeis, past General of the Swiss Army in charge of our security coordinates the security of our crossing with forces present in the GOA, the Swiss confederation and several intelligence agencies. We stop updating the blog on our website and displaying the position of PlanetSolar. It's the most dangerous navigation of our adventure. For this crossing, Patrick returns to take command, so Erwann can take a few weeks off.

We will make the 1'800 miles that separate us from Djibouti in 3 swift weeks; a ship of pirates will pass by, but after we show we are armed and willing to defend ourselves, they will continue their route. After a two days stop in Djibouti where Erwann regains command, we continue towards the Red Sea boarding, besides the soldiers, Gérard d'Aboville, who will sail up the Red Sea with us.

Crossing the Red Sea and arrival:

The soldiers of G4S, that have spent a month with us, leave half way the Red Sea, because the zone is safer. And here we are, alone again; sailing up the Red Sea, despite bad and sometimes strong wind, is an unbelievable moment. We are closing to the end, and we stop our solar vessel several times in magical places, combining business with pleasure: recharging our batteries and diving in magical sites. MS Turanor PlanetSolar shows us that she can be a logistic support boat, and a dive boat as well.

With Erwann, we decide to stop at Port Sudan, our batteries are out of power and our food reserves are empty. Despite this country being at war, the stop will remain deeply impressed in our memory, welcome was very warmful. That has also allowed us to get information necessary to prepare our dive into the Precontinent II site. The underwater village of the master Cousteau where we will make 3 historical dives in this magical site.

Then we cross the Suez Canal, and we are the first solar boat to join a convoy and make the 180 kilometres from Suez a Port Saïd.
What a feeling to be back in the Mediterranean that we had left in October 2010! Sailing back is complex, during the month of April 2012; we experience depression after depression and we need all our expertise to reach Monaco. We make a last stop at Calvi, in Corsica, where Patrick reaches us: we will be the five eco-adventurers on board to close this first solar world tour. During the last day of navigation from Corsica to Monaco we achieve our production record and we cross the last line of longitude on May 4, 2012 at 14h13. We have successfully completed the first world tour made by a solar energy vehicle of any kind, in human history. A great party is organized in Monaco to which Didier Burkhalter, member of the Swiss Federal Council and Prince Albert of Monaco attend as well as all our friends and partners.

PlanetSolar recharges batteries in the Red Sea… March 2012

Team:

Creator and founder: Raphael Domjan

Co-founders: Paola Ghilanni, Pierre-Marcel Favre, Stefan Nowak, Gérard d'Aboville, Immo Stroeher, Pascal Goulpié

Ground team:
President and CEO: Raphaël Domjan
Webmaster, technical communication and video, Alexis Domjan
Scientific Coordinator: Pascal Goulpié
Marketing: Dany Faigaux 2006 to 2010, then Patrick Cotting 2010 to 2012.
Communication: Bernard Schopfer, Kornelia Kneissl, then Rachel Bros de Puechredon
Assistants: Catherine Maher, Pierre Carroz, Corinne Mottu, Victor Koreva
Chief Security Officer (CSO): Christophe Keckeis

Eco-adventurers:
Expedition leader: Raphaël Domjan (Switzerland)
Captain (Monaco-Nouméa): Patrick Marchesseau (France)
Captain (Nouméa-Monaco): Erwann Le Rouzic (France)
Engineer: Christian Ochsenbein (Switzerland)
Quartermaster: Jens Langwasser (Germany)

Godfathers:
Gérard d'Aboville
Albert Falco
Jean Verne
Jean-Loup Chrétien
Nando Parrado
Jean-Luc Van Den Heede (VDH)
Jean-Louis Etienne
Jacques Rougerie
Jason Lewis
Nicole et Serge Roethli
Nicolas Prantzos
Kenichi Horie
Jean-Louis Aucouturier

Partners:

Main Partner: Candino SA, ImmoSolar

Official Partner: Presence Switzerland, Sunpower corporation

Host town: Yverdon-les-Bains (Switzerland), Monaco, Hamburg.

Official supplier:

AirexBaltek, Autodesk, Ciel électricité, Drivetek AG, SIG, Moser Design SA, Dupont de Nemours, ECA, E-gestion, Gaia, Swisswine, Oceoprotec, Gerflor, Horus Networks Sarl, Hummba, IBR systemi, Wago, Polaroid, Importexa, Imtech, Knierim-Yatchbau, MGI group, Café la semeuse.

Official supporter:

Adrena, BCCC, Easymove, Energissima, Dominique Fremond 3D, Solstis, Loterie Romande, Infonext, Ingold, Lomocean, Meyer Burger, Satellite communication, Tempur, Y-Parc, 5/5 Traduction, Yello, Sept autour du monde.

Scientific partner:

Heig-VD, ESA (European space agency), MétéoFrance, Pasan, Rivendell

Institutional partner:

French Ministry of ecology and transportation, Ifremer, Maison d'ailleurs, Myclimate, Lake Geneva Museum, Canton of Vaud, Canton of Neuchâtel, UIM, SolarPlanet Foundation.

Raphael on board of PlanetSolar

Competitors and pioneers:

Kenichie Horie, partially crossed, in 1985, the Pacific on a solar boat, from Hawaii to Japan and in 1996 he crossed the Pacific for the first time, from Ecuador to Japan.

The crossing of the Channel will be achieved only in 1997, then in 2007 another Swiss boat, Sun21 crosses the Atlantic Ocean.

It seems that in the eighties and in 1996, two first projects to tour the world on a solar boat had been conceived, but they never succeeded to raise financial funds and technical means necessary to achieve them.

Several competitors (Austria, France and United Kingdom) have tried to set up an expedition before our departure. It seems they all gave up after we started our journey around the world.

Eco-Exploration and scientific research:

We had on board of PlanetSolar a datalogger, registering more than 160 technical and meteorological parameters.

We have, for example, measured insolation values during our entire journey around the world, but we also have studied the albedo of the ocean and the thermal behavior of the solar cells of PlanetSolar.

Our routing tools and our insolation charts together with actual on-board measurements have allowed our partner MétéoFrance to test the reliability of these data.

Still today, the engineering school of Yverdon-les-Bains, work on the data we collected during our expedition.

Books and documentaries:

Book:

PlanetSolar, 2010-Edition Favre Lausanne-Raphaël Domjan/Roger Jaunin
23x21cm144 pages. Three languages F/G/E 28.00 €ISBN: 978-2-8289-1155-3

PlanetSolar, 2012-Edition Favre Lausanne-Raphaël Domjan/Roger Jaunin
23 x 21cm176 pages. French 33.00 € ISBN: 978-2-8289-1279-6

Documentary:

«Chasing the Sun» 52' HD-16:9, Three languages F/G/E*
Director: Olivier Vittel, Produced by «PlanetSolar Foundation» Distributed by: Terranova
*A 13' and a teaser have also been produced.

Conclusion:

We have proved, thanks to the success of this world tour, that we have technologies, knowledge, raw materials, and renewable energies to all keep living on our wonderful blue planet becoming sustainable and respecting our environment.

Apart SolarImpulse, the project of my friend Bertrand Piccard, no other eco-adventure has ever succeeded in pulling together the technical, human and financial means necessary to achieve such a result.

Starting from nothing, we have been able to finance this expedition, to build the biggest solar boat of the world, and finally to cross the oceans, touch five continents propelled by solar energy only. We have several first-time-ever exploits to our credit, and records. We are the solar vehicle that has gone the farthest distance.

We have been on all major TV networks of the world (BBC, CNN, etc.), and thousands of articles have been written all over the planet.

We have participated in the development of a solar routing system that today equips container ships. But we also have proved the reliability of these technologies of the future.

We have also developed technical and scientific research, and modestly we have contributed to improve knowledge and techniques.

We have accomplished an incredible adventure and making a journey around the world on a solar boat will remain a magic moment of my life. It is engraved forever in my heart and in the heart of the companions of my journey.

We have proved to the world that we can change, and that we must remain optimistic.

PlanetSolar and crew at the end of the word tour, in Monaco.

From left to right: Jens Langwasser, Raphael Domjan, Patrick Marchesseau, Erwann le Rouzic, Christian Ochsenbein

«The world of tomorrow will reflect our wisdom of today» Raphael Domjan

planetsolar

Raphaël Domjan MI'11

Expedition leader