

# MONDAY 5 OCTOBER 2015

## BUSINESS SESSION

## EDUCATION

# SOLAR IMPULSE & HYDROCARBONS: BUILDING BLOCK FOR RENEWABLE ENERGY

### Back

in March of this year, an aircraft named *Solar Impulse 2* took off from Abu Dhabi to attempt to fly around the world powered only by energy from the sun. This effort was the culmination of a project started in 2002 through the vision and determination of Bertrand Piccard, who in 1999 was the first man, with Brian Jones to circumnavigate the world in a balloon. By early July, *Solar Impulse 2* had reached Hawaii, where it was forced to halt due to battery damage sustained, according to Piccard, due to human miscalculation rather than any design fault.

In 2016, the *Solar Impulse 2* team plan to complete their pioneering, world-circling solar-powered journey. And with Andre Borschberg, the project's co-founder, Piccard will be taking turns to pilot *Solar Impulse 2*, a single seat monoplane that "would not exist without the chemical industry."

Born in Switzerland, 57-year old Piccard is from a family of explorers and adventurers: Grandfather Auguste was the first man to explore the stratosphere, and father Jacques an oceanographer and submariner who reached the bottom of the Mariana Trench, 11,000m below the sea surface, in 1960. A trained psychiatrist and hypnotist, Piccard was also

introduced to the EPCAs 49<sup>th</sup> Annual Meeting as "an adventurer and explorer of the human spirit." This is what he told the audience:

"It's not often we can thank directly the people who made something possible," Piccard began. "But the *Solar Impulse* project could not have happened 20 years ago because there wasn't the mentality or the products. *Solar Impulse* is a demonstration that industry can reconcile environmental protection with industrial development."

Continuing, Piccard said the project "represents a Clean Technology Revolution, which protects the environment, saves energy and preserves natural resources." He explained that the plane's solar powered electric engines are 97 per cent efficient, and he credited the chemical industry for providing the technical expertise and the products that helped to make constructing and flying the plane a reality. These products include the batteries, the structural elements – including "plastics stronger and lighter than steel" – and the insulation materials.

With around 17,000 solar cells on its wings, *Solar Impulse 2* stores solar power in its batteries by day so it can fly by night. It is a similar weight to a family car despite having a wingspan of 72m. "The plane can stay in the air forever, and it only lands to change pilot!" said a laughing Piccard.

Behind the sheer excitement and creativity channelled and demonstrated by the

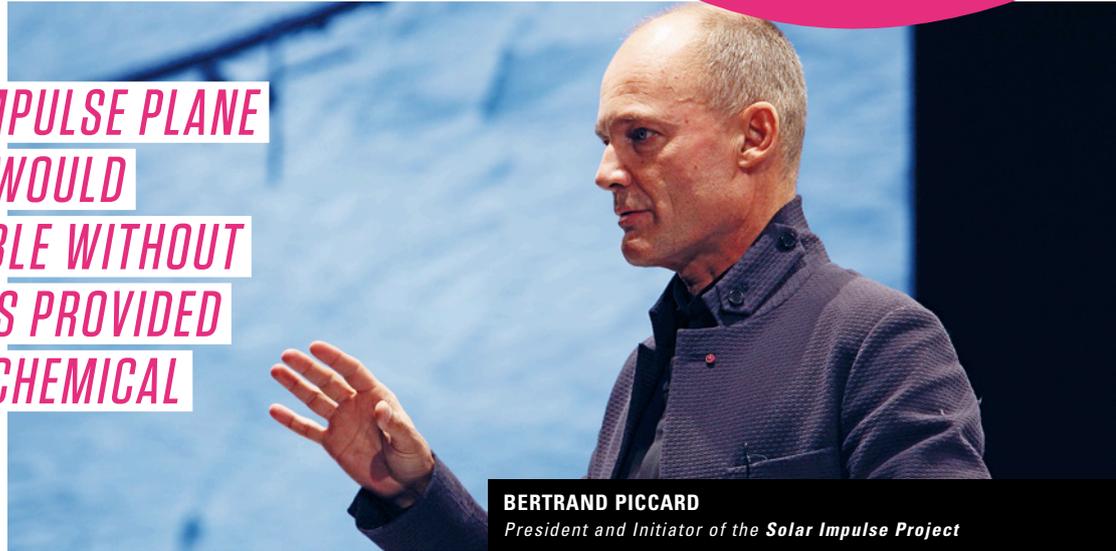
*Solar Impulse* project is a serious message. "Today's world," Piccard remarked, "could halve its energy demand and emissions" through the use of more energy efficient clean technology. And it's a message he wants

"THE PLANE CAN STAY IN THE AIR FOREVER, AND IT ONLY LANDS TO CHANGE PILOT!"

to get through to the press, politicians, intergovernmental organizations and the public. "We have to stop seeing climate change as a problem for the next generation. We need to address it today! It's not a problem – it's a very profitable opportunity.

In Piccard's view, "the big 20<sup>th</sup> century achievements have not been based on new ideas. Innovation is not a new idea – it's an old belief that has been left behind."

**“THE SOLAR IMPULSE PLANE AND PROJECT WOULD NOT BE POSSIBLE WITHOUT THE SOLUTIONS PROVIDED BY THE PETROCHEMICAL INDUSTRY”**



**BERTRAND PICCARD**

President and Initiator of the *Solar Impulse Project*

“WHEN YOU ARE BALLOONING, YOU ARE A PRISONER OF THE WIND, WHICH PUSHES YOU TO THE UNKNOWN. THE ONLY FREEDOM YOU HAVE IS TO CHANGE ALTITUDE AND FIND BETTER WINDS TO TRAVEL IN DIFFERENT DIRECTIONS. SO IF THE WINDS OF LIFE ARE KEEPING US IN THE WRONG DIRECTION, THEN CHANGE ALTITUDE, AND SEEK TO FIND NEW SOLUTIONS AND ANSWERS.”

He noted that Leonardo da Vinci had plans for a machine that would fly, but could not share his vision with a world that viewed his imagination as dangerous heresy. Challenging long-standing beliefs with new combinations of existing knowledge and capabilities offers a way to overcome today's greatest threats, which are to the world's ability to obtain and sustain long-term quality of life for people and the planet.

Piccard offered ballooning as a metaphor for pioneering: “When you are ballooning, you are a prisoner of the wind, which pushes you to the unknown. The only freedom you have is to change altitude and find better winds to travel in different directions. So if the winds of life are keeping us in the wrong direction, then change altitude, and seek to find new solutions and answers.”

To change height, or stay airborne, balloonists may need to drop ballast. He suggested that we might consider what human ballast could be jettisoned: “Common assumptions: the certitudes and habits that we need to challenge or ditch in order to make change.” He urged the audience to examine, engage with and understand the paradigms that sustain our views of the world and its possibilities, and described “freedom as the ability to envisage every option and its likely consequence before taking action.” And when crises occur, they

should be used “to stimulate new ways of thinking.”

“Success,” Piccard continued, “is just when you try one more time than the numbers of failures.” And what we learn from failure, we use to succeed.” He recounted how, when ballooning around the world, he and his co-pilot in *Breitling Orbiter 3* almost failed because the fuel that kept their balloon aloft had almost run out. “It was then I began to dream of fuel-free flight.”

*Solar Impulse* began with the construction of a plastic model in 2004/5, but “there was no team, no technology and no money,” Piccard recalled. But inspired by “the Dumbo analogy” – the Disney cartoon elephant that used its massive ears to fly – *Solar Impulse 2* employs its huge wings that are stiff, strong and light enough to fly “thanks to the chemical industry.”

Surprisingly, Piccard noted, “it was not aeronautical people who helped us build the plane, nor were the oil companies among the main partners who pushed development despite the fact that *Solar Impulse 2* is built from oil products.” Among its key partners are chemicals companies, Solvay and Covestro (former Bayer Material Science), an elevator manufacturer, Schindler, a watch and timekeeping specialist, Omega, and the technology and engineering group,

ABB. And it was a shipyard that specialized in using carbon fibre that built the plane's wings, Piccard said, while noting that “it wasn't people selling candles who invented the light bulb!”

Innovation, he said, often comes from outside the system, recounting how his grandfather had a beer cask factory build his aluminium pressurised cabin. However, he suggested that innovation and exploration of the kind that his family has engaged in requires three key ingredients: Curiosity to try something new, perseverance to overcome obstacles, and respect to ensure the whole enterprise delivers something useful. If it's not useful, it's selfish.”

During a post-speech Q&A session, Piccard emphasized that the world needs incentives to change. “For example, we can't dump garbage in the outdoors, but we can dump CO<sub>2</sub> into the atmosphere. We need legal frameworks if we are to tackle climate change. We still build houses that are badly insulated, use old light bulbs when new ones reduce energy use and extend life. And we need to recognize that customer choice needs to be infused with knowledge and incentivised.”

“We have legal frameworks for health, education, the police, taxes. So why not for clean technology, too?”