Solvay ready to
partner on climate action

#COP21
#DIALOGUE
#CO_2
#SOLUTIONS
#INVESTMENTS

CONTENT

We recognize the challenge

Warming of the climate system is unequivocal. Human activities resulting on greenhouse gas emissions are numerous and diverse: transport, housing, energy, industrial processes, agriculture... As the world population grows, the number of issues we are facing will continue to rise. The evidence is overwhelming and it is time to act. Beyond governments who have to set up the rules, the private sector can support the transition to a low-carbon economy. Governments and businesses must partner to fight against climate change.

"We want COP21 in Paris to be ambitious, successful and inspiring for the future"

Jean-Pierre Clamadieu,
CEO of Solvay

COP21 • CMP11
PARIS 2015
UN CLIMATE CHANGE CONFERENCE

2 WAYS TO REDUCE OUR IMPACT ON THE ENVIRONMENT

improving the efficiency of our processes
↓
a better use of the energy and feedstock

deliver climate-resilient solutions
↓
carbon life cycle approach

INSIGHT

Solvay will reduce its CO_2 intensity* by 40% between now and 2025

- step up its energy efficiency program SolWatt
- continuously innovate on its production processes
- develop clean technologies
- increase the share of renewables in energy production and supplies

*greenhouse gas emissions per euro of added value

Carbon pricing stimulates investment decisions

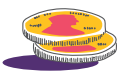
Solvay believes that carbon pricing, applied to all sectors of the economy, can be used as a unifying and powerful tool to help drive the fight against climate change. Carbon pricing should be global and rely on tools such as emission trading schemes for industry.

SOLVAY SUPPORTS CARBON PRICING INITIATIVE

To foster establishment of well-designed carbon pricing policies by governments worldwide, Solvay partners with businesses, governments, institutions and associations in the Carbon Pricing Leadership Coalition. The Group has also adopted the Business Leadership Criteria on Carbon Pricing of Caring for Climate, an initiative of the UN Global Compact.

CARBON PRICING LEADERSHIP COALITION
CPLC

Caring for Climate
THE GLOBAL COMPACT



WE HAVE SET UP AN INTERNAL CARBON PRICE AT 25€/T FOR 2016

It means attributing a cost to greenhouse gas emissions and a value to emissions savings in all investment projects. The cost is higher than the current market prices for CO_2 emissions. Solvay's capital expenditure is redirected to low carbon and investments are equipped for future climate policies.

#ENGAGE

We mobilize with others

Industrials need to join forces in the fight against climate change and must now act on two key levers in view of the global agreement on climate change:

- *promoting convergence between emission reduction efforts and between carbon pricing policies worldwide,*
- *developing a shared approach to innovation.*

BUSINESS CAN ENABLE THE NECESSARY TRANSFORMATION AND IS READY TO PLAY ITS ROLE. CLIMATE CHANGE IS ALSO A GREAT OPPORTUNITY FOR US, AS OUR INNOVATIVE SOLUTIONS CAN HELP MEETING THE CO_2 EMISSIONS GOALS.

BUSINESS FOR COP21.ORG

These proposals aim at presenting the contribution of the business community for the success of COP21 in Paris. A large number of chairmen and CEOs worldwide want to deliver a powerful message to governments on the need to achieve an ambitious yet balanced global climate agreement and on the business' willingness to make it a success.

LCTPi Led by wbcsd

Low Carbon Technology Partnerships Initiative (LCTPi) is a collaborative platform that brings together the World Business Council for Sustainable Development, the Deep Decarbonization Pathways Project and the International Energy Agency. It aims to present a concrete action plans at COP21 for the large-scale development and deployment of low-carbon technologies.

Business dialogues

Jean-Pierre Clamadieu is actively engaged in dialogs between business and governments and climate negotiators in multiple policy-making circles around the world. Solvay also contributes to forward-thinking initiatives to foster development and deployment of low carbon technologies that are key to a sustainable planet.

KEY MESSAGES

- Launching a constructive and lasting Business Dialogue convened by the COP Presidency, between the business community and governments
- Boosting investments in low-carbon business solutions and technologies
- Intensifying R&D, innovation and deployment of mature and breakthrough technologies
- The need of carbon pricing to integrate climate externalities into our economic decisions

INSIGHT

Industry needs clear and long term signals. It is critical to have governments put in place clear, bold, long-term policy frameworks.

#DELIVER

Chemistry is key to the solutions

4 INNOVATIVE FIELDS TO FIGHT AGAINST CLIMATE CHANGE

01

Mobility

reconciling transport and environment

Reducing weight by 100 kg cuts CO_2 emission by 10 g/km

reduction in fuel consumption and CO_2 emissions of up to 7%

Ligthweighting, a key driver to cut CO_2 emissions

A vehicle's weight directly impacts its fuel consumption and hence its CO_2 emissions. Reducing weight by 100 kg cuts CO_2 emission by 10 g/km. Our specialty polymers and high-tech plastics-based solutions are designed to replace metal effectively without compromising safety.

Rolling resistance

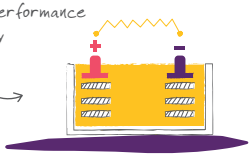
Used in energy saving tires, our Highly Dispersible Silica decreases rolling resistance by 25%, helping to achieve a reduction in fuel consumption and CO_2 emissions of up to 7%.

elimination of more than 99% of particles

Depollution : on the way to 95g CO_2/km in 2020

Eolys PowerFlex® is a fuel soluble catalyst, essential for the proper functioning of diesel particle filters. In combination with another catalyst to reduce nitrogen oxides (NOx), the whole system provides a 90% reduction of NOx, the elimination of more than 99% of particles, a reduction in fuel consumption of 3 to 5%.

boost the performance of a battery

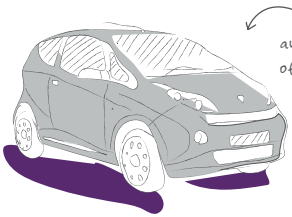


Batteries for electric and hybrid vehicles

Solvay is relying on its expertise in the field of advanced materials and fluorine compounds to boost the performance of a battery cell's five main components, with a specific focus on binders, separators and electrolytes.

BlueCar® showcases Solvay know-how in energy storage

Thanks to Solvay's lithium salt (LiTFSI), the BlueCar® has an autonomy of 250 km while other electric vehicles usually offer around 200 km!



autonomy of 250 km

Chemistry is key to the solutions

4 INNOVATIVE FIELDS TO FIGHT AGAINST CLIMATE CHANGE

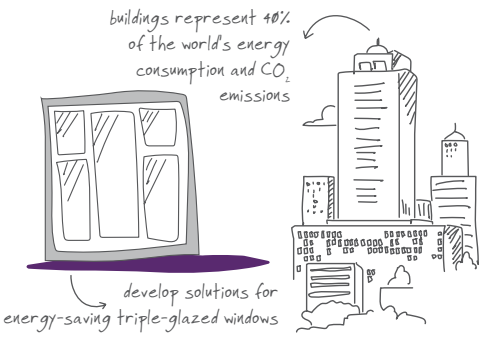
02

Buildings

acting on energy efficiency and thermal insulation

Buildings

represent 40% of the world's energy consumption and CO_2 emissions. We need products for long life efficient piping, insulated walls and roofs, sealed windows... At Solvay, we help develop solutions for energy-saving triple-glazed windows and for foam wall coverings to maintain comfortable temperatures in near-zero-energy housing. Moreover, our cooling & heating systems products are very easy to install and last almost forever.



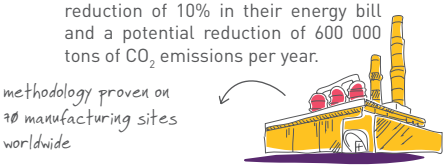
03

Industry

combining industrial performance with energy efficiency & carbon footprint

Solwatt, the energy efficiency program designed by Solvay

Our teams help industrial sites to identify projects that reduce their energy costs and environmental footprint. They set up specific actions from initial sourcing to ultimate consumption with a return on investment within three years. Launched in 2011, this methodology has been proven on 70 manufacturing sites worldwide, with an average reduction of 10% in their energy bill and a potential reduction of 600 000 tons of CO_2 emissions per year.



SOLVAir® to maintain air quality

Solvay offers sodium bicarbonate-based solutions to help industries such as coal or oil-fired power plants or household garbage incinerators to treat their fumes and recycle the resulting waste. SOLVAir® solutions help to eliminate pollutants such as hydrochloric acid, sulfur oxides, dioxins and particulates in the stack, to meet the most stringent legal limits.

#DELIVER

Chemistry is key to the solutions

4 INNOVATIVE FIELDS TO FIGHT AGAINST CLIMATE CHANGE

04

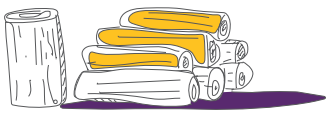
Bio-sourced chemistry

limiting the use of fossil resources

Ocalio™: a cellulose acetate bio-plastic

Solvay manufactures Ocalio™ by using wood pulp, and entirely renewable resource obtained from SFI certified forests. Ocalio™ has a bio-based content of 50% and a much lower CO_2 manufacturing footprint compared to conventional plastics. Ocalio™ outperforms alternative plant-based products in terms of mechanical performance, transparency, heat resistance and processability. It can be easily molded and designed for a wide range of consumer goods end-use such as eyeglass frames, food packaging and electronic devices.

bio-based content of 50% and a much lower CO_2 manufacturing footprint



Torrefied biomass: contributing to energy transition

Torrefied biomass, which handles and burns similarly to coal, is produced by Solvay through torrefaction, a process that modifies the chemical properties of waste wood and biomass. Today, some power plants in Europe use traditional wood pellets to replace coal. Torrefied biomass however contains 35% more energy by weight than wood pellets. Torrefied biomass can immediately and practically substitute coal, enabling power plants to generate clean energy.

torrefied biomass can immediately and practically substitute coal, enabling power plants to generate clean energy

Invent ideas

CAPTURING CO_2 TO CONVERT IT INTO A RAW MATERIAL

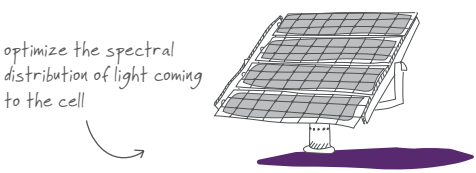
Using CO_2 is a concept that Ernest Solvay had already incorporated into his sodium carbonate manufacturing process 150 years ago. He produced CO_2 by calcining limestone and then recovered it to convert it into soda ash, used as a raw material to manufacture glass. Today, our researchers are developing differentiated technologies to capture CO_2 and explore new chemistry energy-efficient processes that use CO_2 as a carbon feedstock. The end game is to limit Solvay's industrial footprint as well as the use of fossil fuels.

CIRCULAR ECONOMY

Every year in Europe, nearly 25 million tons of plastic waste is generated, 10 million tons of which ends up in landfill. Today, only a tiny part of this waste is recycled or recovered as energy. This is a huge challenge which Solvay has taken up with several European universities. The aim is to find a competitive and flexible process to convert waste plastics into fuels and other compounds out of which high-value added products can be made. The first demonstration unit should be operational in 2018.

FURTHER BOOSTING SOLAR ENERGY

Significant part of the sun radiation is not captured by the current solar cells. Thus, improvements are expected in the UV and Infra-Red. Solvay is working on an active inorganic luminescent material, able to optimize the spectral distribution of light coming to the cell. Ongoing tests reveal that this innovative material allows achieving a significant jump in yield and efficiency compared to existing technologies.



Solar Impulse, pioneering chemistry for a zero-emission plane

For more than 150 years now, Solvay has been fostering a tradition of audacity and a pioneering spirit which led it to turn the dream making Solar Impulse into a reality. Dream and technological innovations converged to make this solar-powered plane extra-ordinarily light, to equip it with ultra-performing solar cells and batteries so it could fly both day and night. Solar Impulse became a flying lab showcasing Solvay's innovative chemistry with state-of-the-art materials that are indispensable for the development of alternative energy. Through this partnership, we have pushed back the frontiers of chemistry, developing unique products and solutions, which today are used in many different applications. We have demonstrated Solvay's capability to create sustainable chemistry, a chemistry that provides solutions to the many challenges of the planet.

A COMBINATION OF DREAM AND TECHNOLOGICAL INNOVATIONS

Creating a flying lab to...

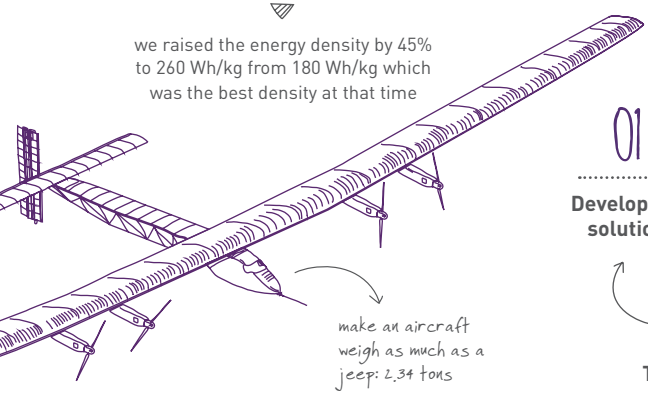
ENERGY MANAGEMENT
store, consume and optimize use

breakthroughs in energy storage thanks to Solvay's lithium-ion batteries components

we raised the energy density by 45% to 260 Wh/kg from 180 Wh/kg which was the best density at that time

LIGHT-WEIGHTING
thanks to Solvay's most advanced materials

how to make an aircraft weigh as much as a jeep: 2.34 tons

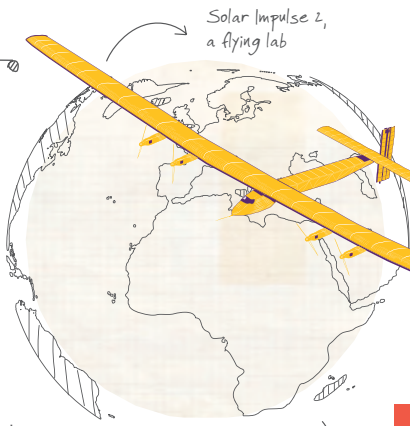


01 **Develop new solutions**

02 **Breakthrough in energy storage**

03 **Test our products in extreme conditions**

Where does Solvay make a difference?



01 CAPTURING ENERGY

Solvay's ultra-thin polymer film Halar® ECTFE
- Protects the xNRxsolar panels on the wings
- Turns Solar Impulse 2 into a waterproof electric plane

Solvay's adhesive tape solstick Solef® PVDF
- Closes the tiny gaps between solar cells

02 STORING ENERGY

Solef® PVDF and F1EC components
- Enabling energy storage in 640 kg of lithium-ion batteries = Improving energy density by 45%

03 OPTIMISING ENERGY CONSUMPTION

Lubricant Fomblin® PFPE for mechanical parts
- Resists wear and rust
- Reduces maintenance and energy use

Solkane® 365 MFC special foaming agent for cockpit fairing
- Ultra-light weight
- Insulating polyurethane

04 LIGHT-WEIGHTING OVERALL STRUCTURE

Torlon® PAI polymer for the wing spar
- Refined honeycomb structure, made of paper impregnated with this high-strength plastic
- Excellent properties: strength, torsion, flexion, vibration

KetaSpire® PEEK and PrimoSpire® SRP for fasteners and screws
- Very robust, yet lightweight materials

Sinterline® Polyamide 6 powders 3D
- Printing for complex mechanical parts, such as lighting clips or the housings for the cockpit equipment

INSIGHT

Were all the different technologies found in Solar Impulse be used throughout the world, we could halve the planet's energy consumption. With this flying lab, Solvay aims at coping with the challenges posed by climate change. Chemistry is key participate in the transition to a climate-resilient economy.

SOLVAY

asking more from chemistry®

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