



SOLVAY
asking more from chemistry®

Challenges for the Future: Innovation and Change Respecting the World's Sustainable Megatrends

KOITA Global Forum 2016

Andre Nothomb, Solvay Government & Public Affairs AP,
for KOITA Seoul, October 28, 2016

We are **among World Leaders** in the Chemical Industry



30,000
employees



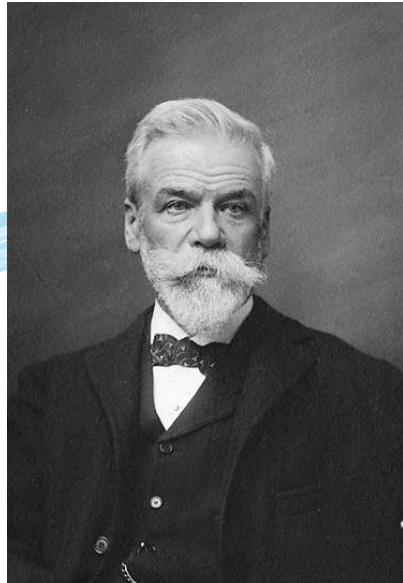
53
countries



145
industrial sites



21
major
R&I centers



*Founded in Belgium
in 1863 by Ernest Solvay...*

*Controlled to this day by the
Solvay family...*



€ 12.4

billion of net sales



€ 2,336

million of REBITDA

Pro forma 2015 figures including Cytec (unaudited)

150 years of Innovation



1863

Ernest Solvay invents
the Solvay process for
producing soda ash



1950

Solvay invents
the plastic bottle



2015

Solvay flies
around the world
with Solar Impulse



1880

Solvay is the first
industrial multinational
operating simultaneously
in the US and Europe



1990

Solvay invents
precipitated
silica for
green tires



1878

Solvay innovates in
social welfare
(paid vacations, social
security, 8-hour day)



1911 & 1927

The congresses
bring together the
greatest physicists
of their day



2015

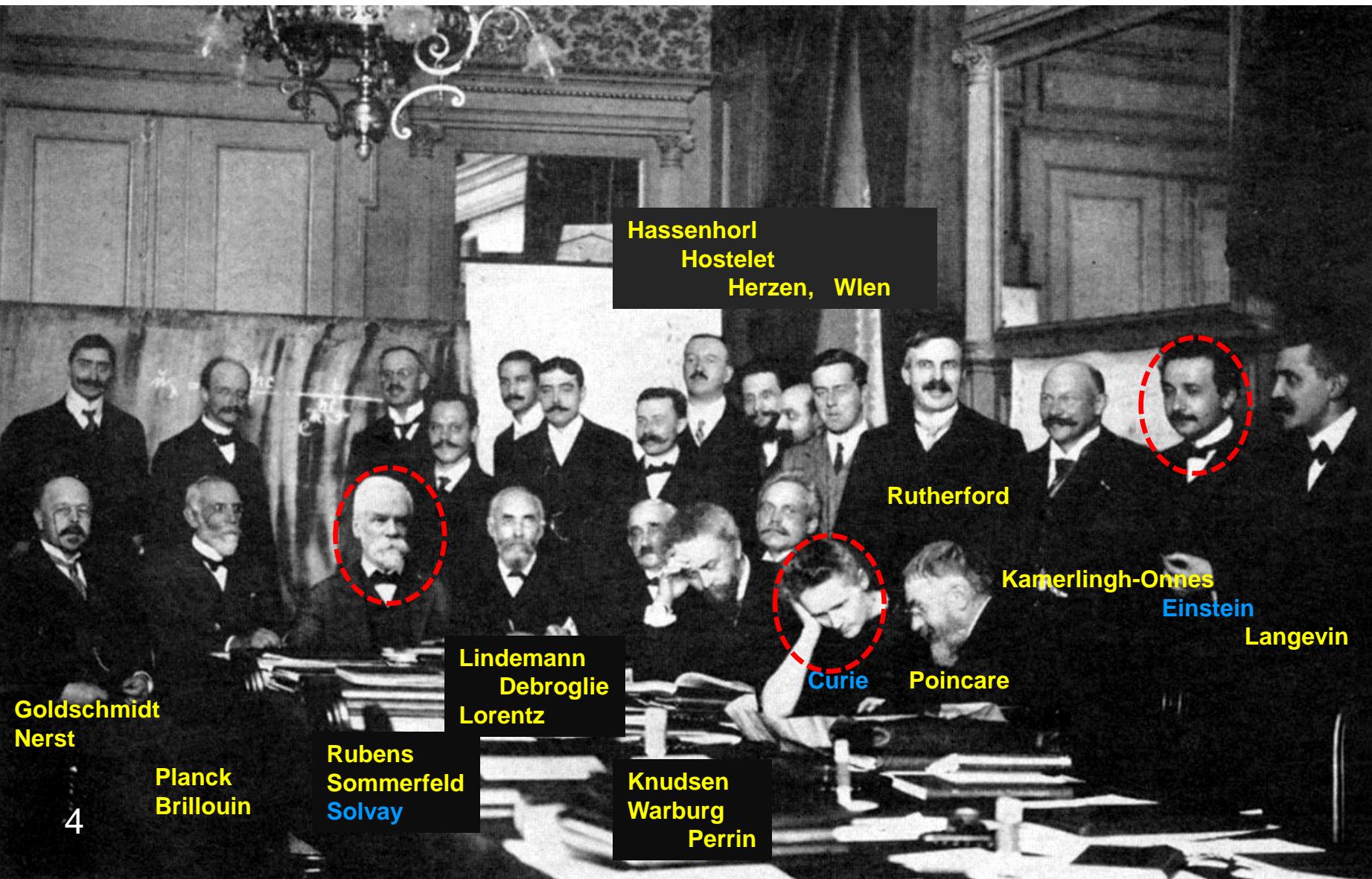
2nd Chemistry
for the Future
Solvay Prize



2011

Solvay
acquires Rhodia

An early **Supporter of Sciences** ...Conseil de Physique in 1912, Brussels...



Goldschmidt
Nerst

Planck
Brillouin

Rubens
Sommerfeld
Solvay

Lindemann
Debroglie
Lorentz

Knudsen
Warburg
Perrin

Hassenhorl
Hostelet
Herzen, Wlen

Rutherford

Curie

Poincare

Kamerlingh-Onnes
Einstein

Langevin

A Balanced Presence

in all Growth Regions



North America

27% of net sales

6,600 employees

47 industrial sites

6 major R&I centers

Latin America

10% of net sales

2,700 employees

9 industrial sites

1 major R&I center

Europe

30% of net sales

14,500 employees

59 industrial sites

10 major R&I centers

Asia-Pacific

33% of net sales

6,200 employees

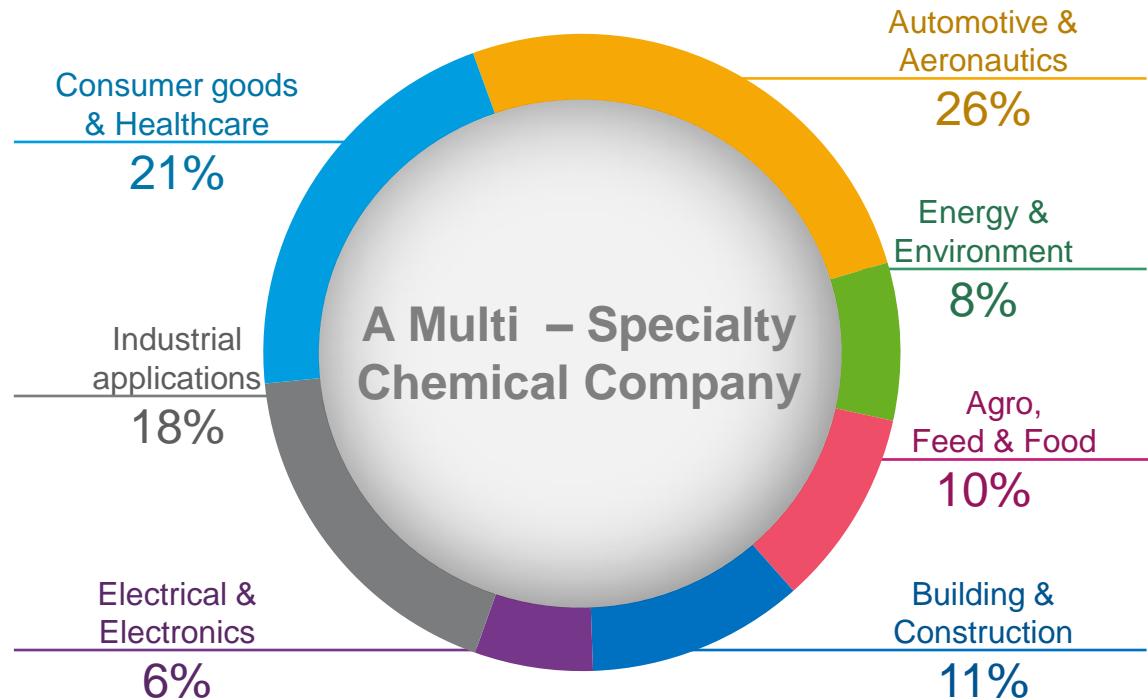
30 industrial sites

4 major R&I centers

Pro forma 2015 figures including Cytec (unaudited)

We Adapt our Product Offering to

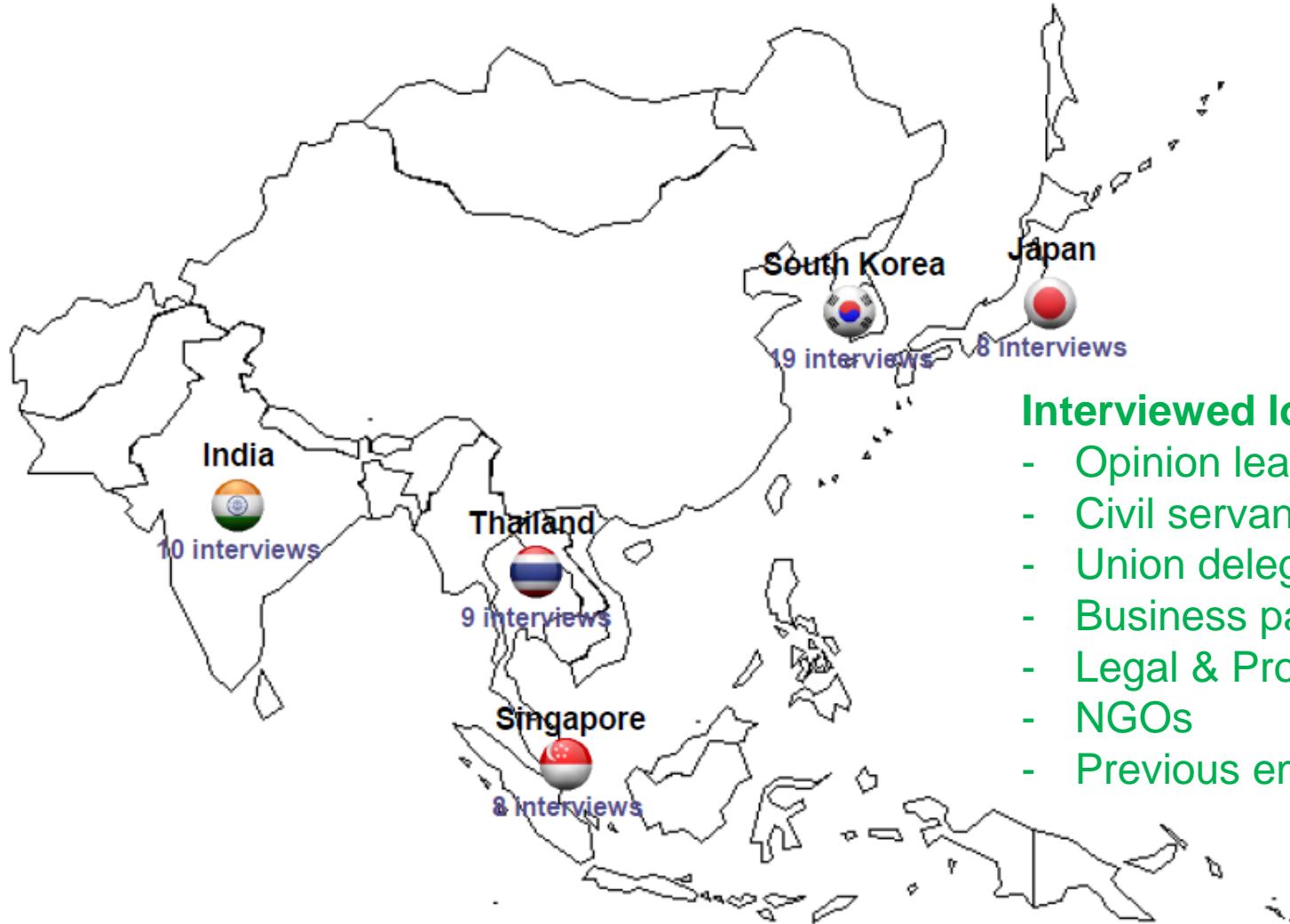
Demanding Markets



Distribution of 2015 net sales
Pro forma 2015 figures including Cytec (unaudited)

We believe that **our Reputation is our Asset**

...2016 Solvay Global Reputation survey...



Interviewed local:

- Opinion leaders
- Civil servants
- Union delegates
- Business partners
- Legal & Professionals
- NGOs
- Previous employees

Chemical Industry image among respondents...

Nowadays, the chemical sector is facing big new challenges...

- > In a fast-evolving world, the chemical sector has to capitalize on 4 key factors of success...

- Improved productivity
- Technology upgrade
- Need for more performance

**High
technology**

- Use of renewable energy and natural resources
- Development of sustainable and eco-friendly products

- Use of the younger manpower
- Development of great talents
 - Upgrade of skills
- Recruitment of the right people

**Talented
human
resources**

- Development of cost effective products
- Conception of high-tech products

Chemical Industry Constraints among respondents...

Beyond customers, other stakeholders may have specific expectations

- > If customers definitely remain the key stakeholders in Asia according to the respondents...

"In country like India, customers are the ones whose opinions actually influence in the market" (India, Business Partner)

"In Japan, customers first" (Japan, NGO)

- > ... other stakeholders have been identified:



Priority to Satisfy Customer Needs...

A reinforced customer-centric approach to deliver a better service for a higher satisfaction

Customer focus

- More reactivity
- More flexibility
- More adaptation to customers' needs

Provide more support to customers and more interactions with them

- *"They are doing well but customer interaction should be more encouraged, the person who is dealing with the clients should visit the customers and understand the problems of the customers more clearly providing support"* (India, Business partner)
- *"They need to interact with the customers of all levels not only with the key customers because there are people who don't even know about Solvay so in order to grow their business they need to be proactive in terms of interaction with the customers"* (Singapore, Business partner)
- *"I would like Solvay to expand their scope of support and contribute in indirect aspects as well more than just direct support"* (South Korea, Scientific communities)
- *"I hope they consider better their customers and public interests"* (South Korea, Business partner)

Be more reactive in response to customers and delivery

- *"To provide faster response for the queries of the customers related to the product as they take a long time to come back on reports"* (India, Business partner)
- *"It will be great if they could react and reflect our demands a bit faster"* (Japan, Business partner)
- *"I think it would be better if they could shorten the terms while taking care of those disturbances. Speed is essential in business nowadays"* (South Korea, KOL)

...Customer Needs **demanding better performances**

A boost in innovation to provide more competitive products

Innovation

- Continue R&D investments
- Provide innovative products at lower costs

Bring more innovation...

- *"They should continue to innovate in terms to improve"* (Singapore, Business partner)
- *"I wish Solvay came to grips with innovation, which will elevate her in new heights without any fear"* (Japan, Business partner)

... at lower costs

- *"I wish to see more innovative products coming up from Solvay, and the cost must be competitive"* (Singapore, Business partner)
- *"They need to work on how to provide new innovative solutions at low cost to the customers"* (India, Business partner)
- *"This will reduce the costs of good – good for cost reduction for many businesses"* (Thailand, KOL)
- *"Supply high quality products with lower prices"* (South Korea, Business partner)

Our activities are structured along **3 megatrends**

Imposed by Global Evolutions...



Responsibly supporting
the development of our
society



Innovating ever faster to
anticipate and adapt
continuously



Producing more, making
better use of fewer
resources

Our Strategic Choices Respond to 24 Trends

Evolving demography & consumers behaviors



Growing world population



Changing balance of economic power



Urbanization



Health and wellness



Ageing society



Collapse of the middle



Middle class booming in Asia, Africa & LATAM



Gender gap decrease



Collective & individual behavior mutation



Regionalization



Globalization of services



Innovation acceleration



Digitalization & mobility



Automated systems



Miniaturization



Acceleration of cycles



Information Age



Life sciences booming



Resource constraints & increased sustainability demand



Ecosystem at risk



Climate change



Competition of resource usage



Financial resources management



Competition of space, lands



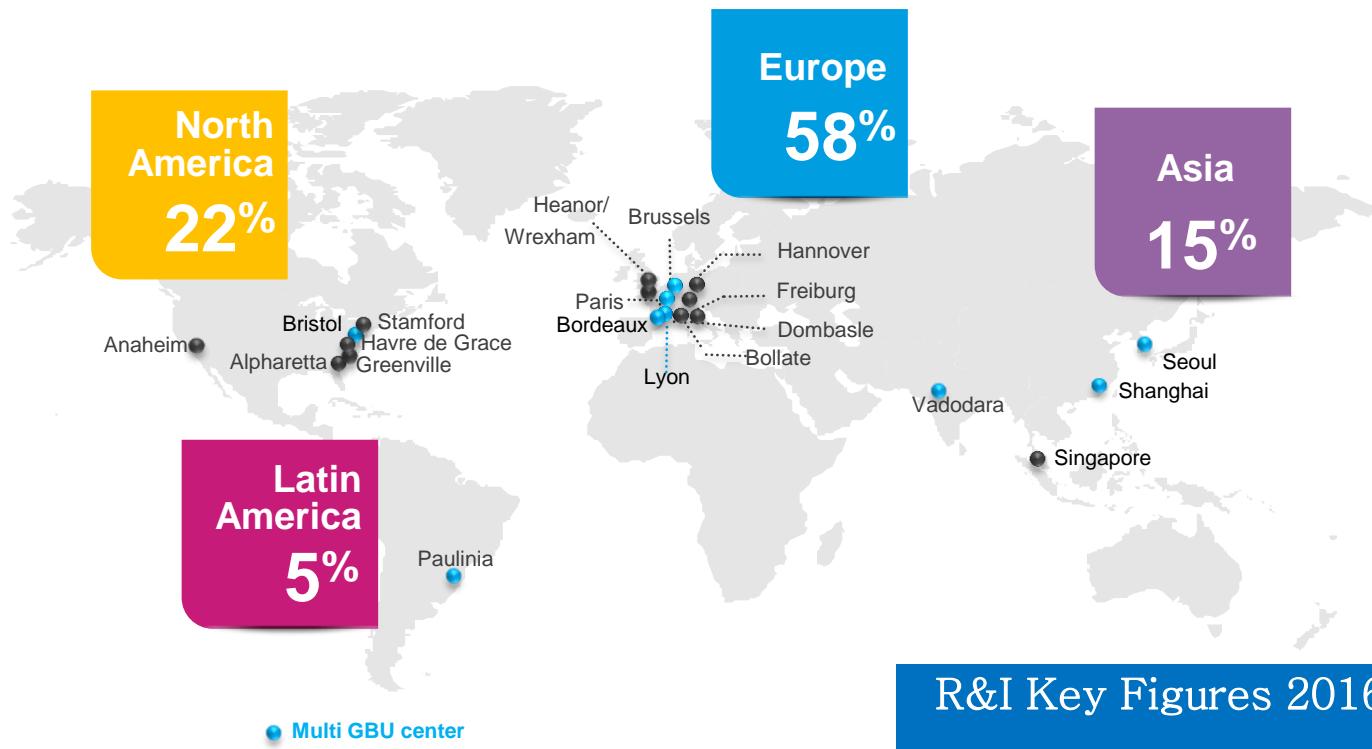
NGOs and citizenship



War for talents



Our R&I Network...



21
Major R&I centers

2 350
Staff in R&I

~ M€
360
Efforts in R&I in 2015

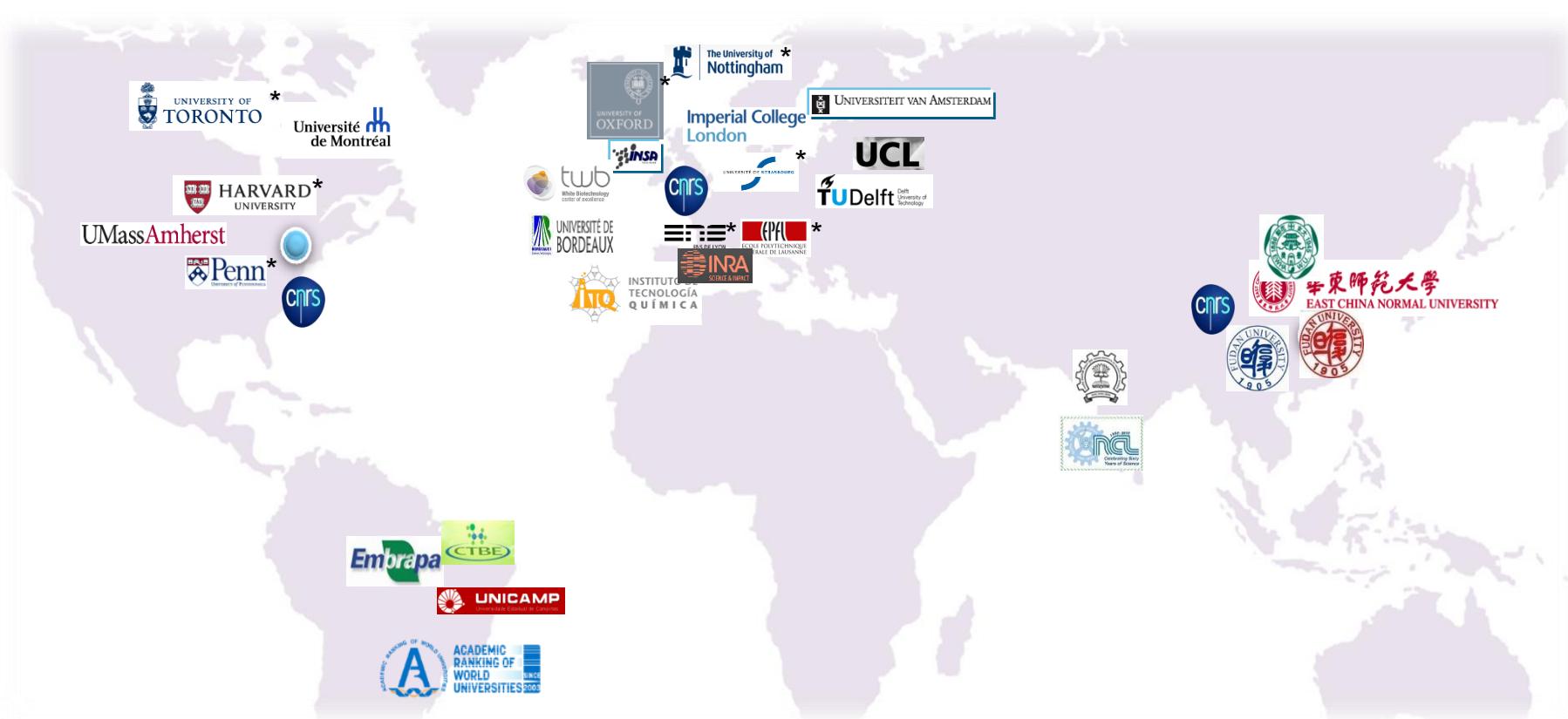
18%
New Sales ratio in
2015 (excl.Cytec)

264
Patents filed in 2015

Collaborative Innovation

- 4 Joint labs with top research institutions of France, China and the USA & the French National Center for Scientific Research (CNRS)
- > 100 collaborative R&I Projects
- €50M invested in Venturing & Start-ups

A Worldwide Network of Researchers Connected to Selected Academic Partners



(*) in Top 100 Worldwide ranking

Others academic partners are in national TOP 10

- To partner with high-level academia
- To lead or take part in Public-Private Partnerships
- To participate and influence in decision-making consortia

Building an Innovative Eco-System in Korea through a unique Strategic Partnership



이화·솔베이 연구센터
Ewha · Solvay Research & Innovation Center
SOLVAY

EWHA: A pioneering University in Korea

- EWHA largest women university in the world with a long history of nurturing the dreams of women scientists
- Ranked as one of top Korean universities with very strong International and national network of scientific collaboration

Key activities of Korea R&I center

- Activities focuses on Energy storage (batteries),
- Printed electronics (display, Photovoltaic) ,
- Advanced materials for automotive (plastics, tires)

Key academic EWHA partnership with

- ➔ joint scientific collaborations (not only with EWHA)
- ➔ Support to development of top scientific female talents (8 scholarships)
- ➔ Offering international internship to students



Focus on the Specialties that will serve real future needs:

Developing more Customized Mission Critical Products

Application targeted materials :

Advanced materials

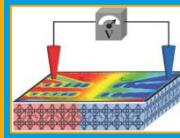
New materials with intrinsic breakthrough attributes



Toward new attributes for more comfort and energy savings

Stimuli active materials

Material and system converting a “stimuli” into a different signal



Toward materials for @digital world

Attribute delivery

New materials able to deliver targeted attributes

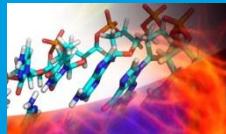


Toward Better protection and sustainable use of materials

New chemistries and processes

New organic chemistries

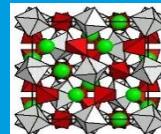
Breakthrough organic chemistry for new attributes



Toward new clean organic chemistries

New inorganic chemistries

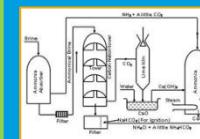
Breakthrough inorganic chemistries to bring new attributes



Toward new inorganic materials & with clean access

Eco-processes

New breakthrough processes



Toward 0 effluents, reduced energy consumption, better competitiveness

Some of our Recent Successes for our current daily lives...

Selected Solvay innovations



Crop protection

**Description:**

Solvent-based formulations

Application / Benefit:

Reduced greenhouse gases with reduced fertilizer use.

BiFor-SafE

**Description:**

Sodium bicarbonate associated with silica

Application / Benefit:

Preventive and curative pest control in agriculture.

EFFICIUM® green tires

**Description:**

High dispersible silica

Application / Benefit:

Automobile and truck tires that reduce consumption and improve wet road holding.

Pipeline rehabilitation

**Description:**

Special grade Solef® PVDF

Application / Benefit:

Rehabilitating pipelines exposed to extremely corrosive environments.

Implies some **Tough decisions...**

SOLVAY TO DIVEST OLED PORTFOLIO TO NISSAN CHEMICAL INDUSTRIES

By Mary Page Bailey | September 21, 2016

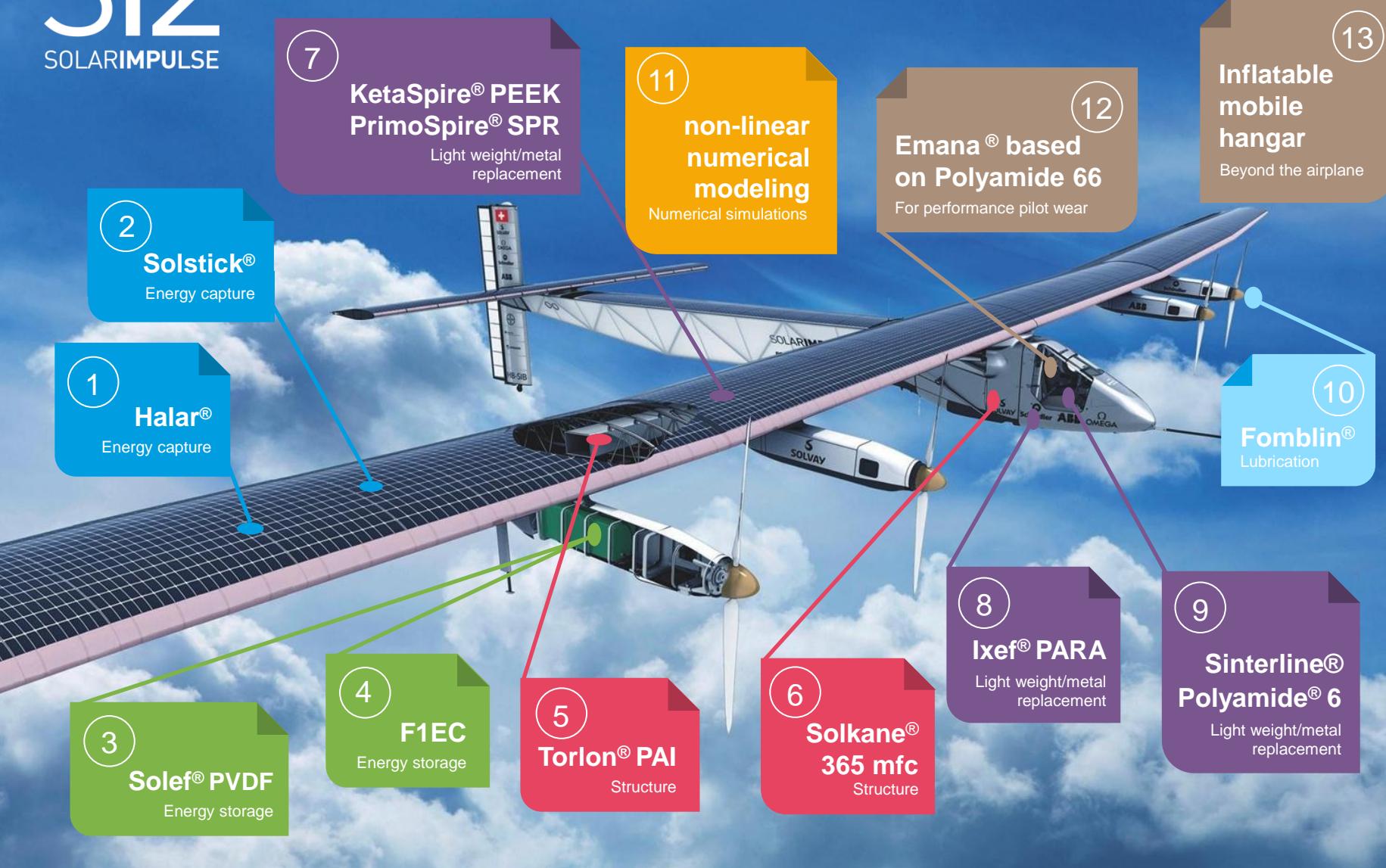
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Solvay S.A. (Brussels, Belgium; www.solvay.com) has reached a final agreement with Nissan Chemical Industries Ltd. to divest most of its OLED (organic lighting emitting diode) patent portfolio.

The sale follows a strategic analysis of the Organic Electronics market showing that new display technologies are being delayed. As a consequence, Solvay has decided to stop its research activities in this area and has started a value assessment of its OLED patent portfolio. It will continue to transfer its patents and technologies and use its resources for other research programs instead.

« Making the impossible possible »



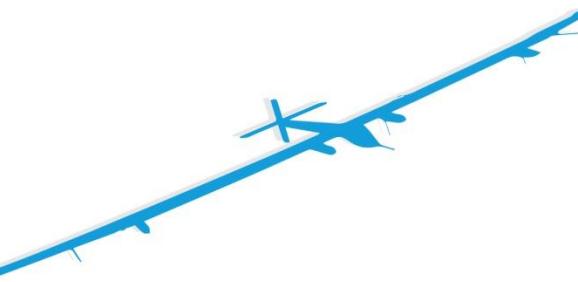
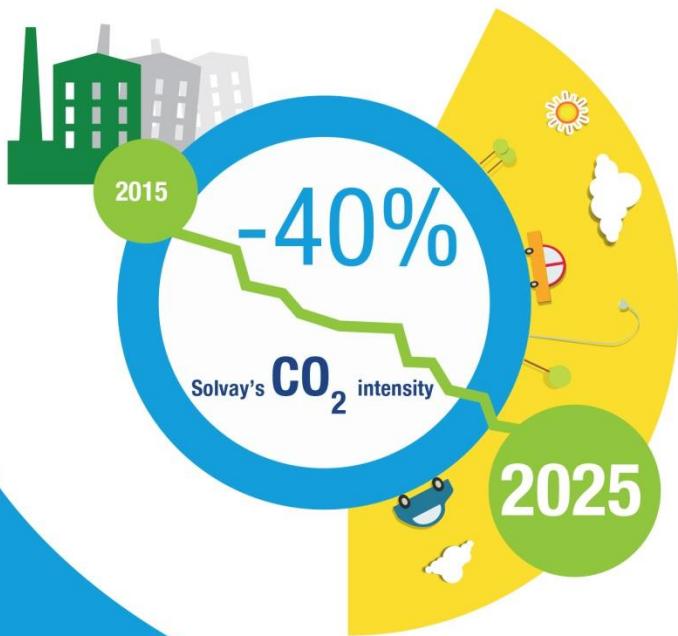
Sustainable Chemistry

Objectives by 2025

1 GREENHOUSE GAS EMISSIONS

Reduce by 40% Solvay's CO₂ emissions intensity

Levers : energy efficiency, industrial processes, clean technologies, more renewables in energy production and supply.
In addition : internal carbon price at 25 €/t to take into account climate challenges in investment decisions.



2 SUSTAINABLE SOLUTIONS

Increase the share of sustainable solutions in the Group's business portfolio from 25% to 50%



3 PEOPLE ENGAGEMENT

Raise employee motivation and commitment to 80% from 75%



Double the number of employees involved in societal actions



4 SAFETY ENHANCEMENT

Halve the number of accidents (MTAR <0,5)

Alignment with UN Sustainability Objectives...

1 NO POVERTY



2 NO HUNGER



3 GOOD HEALTH



4 QUALITY EDUCATION



5 GENDER EQUALITY



6 CLEAN WATER AND SANITATION



7 RENEWABLE ENERGY



8 GOOD JOBS AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



10 REDUCED INEQUALITIES



11 SUSTAINABLE CITIES AND COMMUNITIES



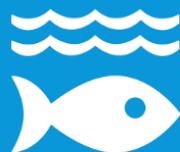
12 RESPONSIBLE CONSUMPTION



13 CLIMATE ACTION



14 LIFE BELOW WATER



15 LIFE ON LAND



16 PEACE AND JUSTICE



17 PARTNERSHIPS FOR THE GOALS

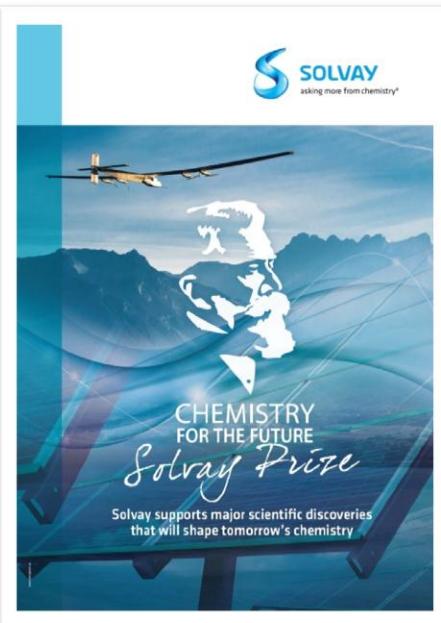


THE GLOBAL GOALS
For Sustainable Development

At the Heart of Global Innovation Ecosystems Perpetuating the founder's commitment as a strong supporter of science



1911: Ernest Solvay establishes first prestigious meetings of top scientist through the Council of Physics



Created on the occasion of the 150th anniversary of Solvay, this prize rewards a major scientific discovery that could shape tomorrow's chemistry and help human progress.

A prize to underline the essential role of chemistry to help solve some of the most pressing issues the world is facing.

The **2015** Chemistry for the Future Solvay Prize was awarded to **Professor Ben Feringa**, University of Groningen, the Netherlands, for his groundbreaking work on unidirectional molecular motors.



Solvay Prize opens the door to **Nobel Prize...?**



**October 2016
BREAKING
NEWS...**

Nobelprize.org
The Official Web Site of the Nobel Prize

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Nobel Prizes and Laureates

Chemistry Prizes ▾ 2016 < >

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▶ Jean-Pierre Sauvage
▶ Sir J. Fraser Stoddart
▶ Bernard L. Feringa

All Nobel Prizes in Chemistry
All Nobel Prizes in 2016

The Nobel Prize in Chemistry 2016
Jean-Pierre Sauvage, Sir J. Fraser Stoddart, Bernard L. Feringa

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The Nobel Prize in Chemistry 2016


III: N. Elmehed. © Nobel Media 2016
Jean-Pierre Sauvage
Prize share: 1/3


Photo: Northwestern University
Sir J. Fraser Stoddart
Prize share: 1/3


III: N. Elmehed. © Nobel Media 2016
Bernard L. Feringa
Prize share: 1/3

The Nobel Prize in Chemistry 2016 was awarded jointly to Jean-Pierre Sauvage, Sir J. Fraser Stoddart and Bernard L. Feringa "for the design and synthesis of molecular machines".

LIVE Video
Watch the 2016 Nobel Prize Announcements

2016 NOBEL PRIZE ANNOUNCEMENTS
Full schedule

2016 CHEMISTRY QUESTION

Did you know you can make machines that are 1,000 times thinner than a strand of hair?

Yes No



SOLVAY
asking more from chemistry®

Thank You for your Attention