












Wrap up on theme 2:

Life cycle and recycling of materials

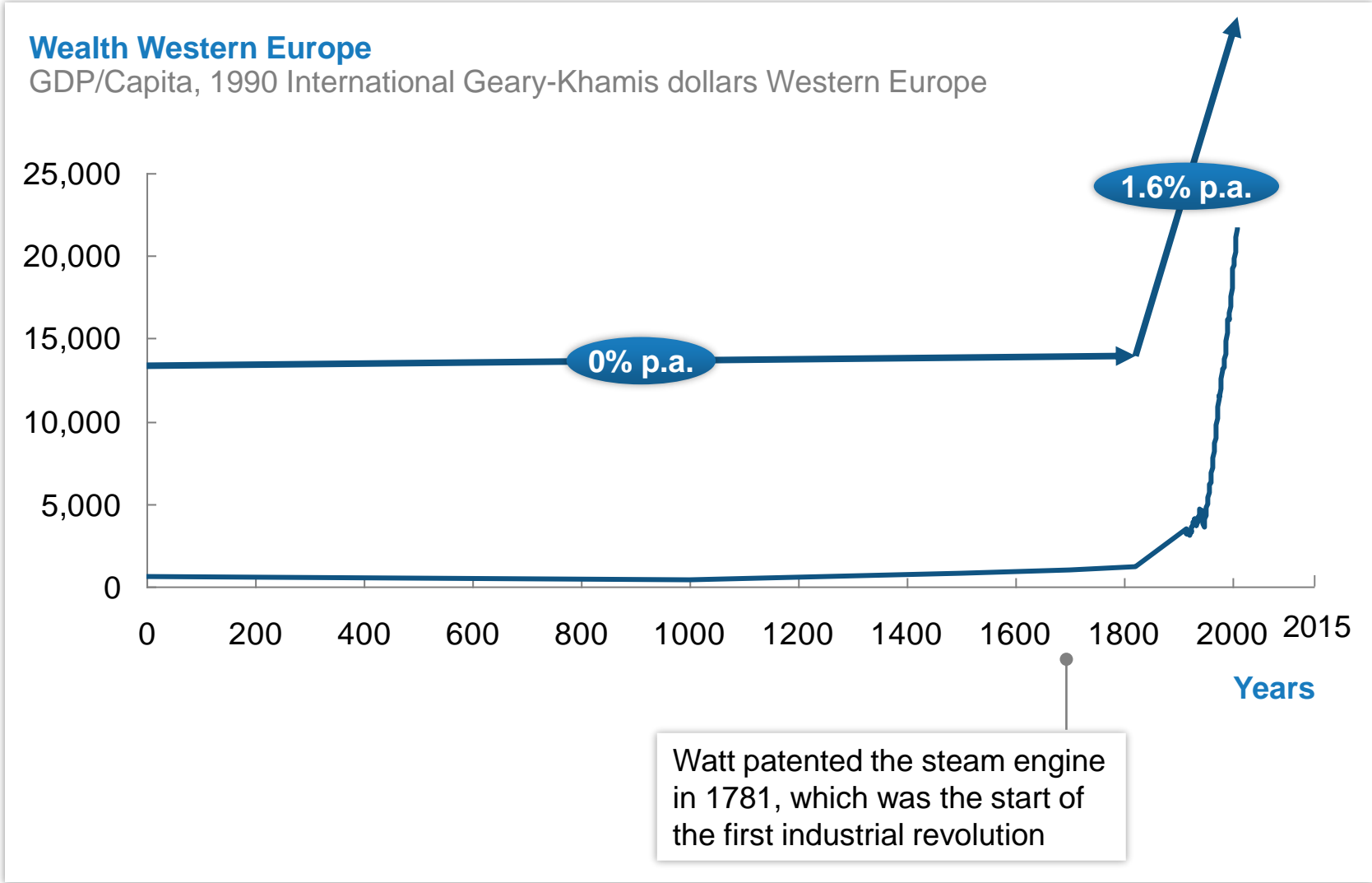
Laurent Bocahut, Founding partner, FLM



Life cycle & Recycling of materials

Workshop	Access to rare minerals resources & feed stock	Life cycle & Recycling of materials	Substitute & alternative materials for competitiveness
1	Rare raw materials issues 	Recycling & recovery 	Materials breakthroughs for 2050 
2	Policies for the xx1st century 	Eco design 	Composites 
3	Better access to R&D 	Value chain management 	Sustainability & Competitiveness 

Our current economic model has led to unprecedented economic success...



SOURCE: Historical Statistics of the World Economy: 1-2008 AD, Angus Maddison

... but has also led to wasteful use of resources...



60%

of total waste is not recycled, composted or reused in EU

Only 5%

of the total raw material input in the EU is recovered by the recycling and waste industry

\$ 52 billion

worth of materials was lost by not recycling the 42 mln tonnes of global e-waste produced in 2014

150 million

tonnes of plastic debris is floating in our oceans, poisoning sea life

... and significant impact on our environment and health

>4%

of GDP is the estimated damage to health from poor air quality in many countries worldwide

15 out of 24

eco-system services are being degraded or used unsustainably

45%

increase in atmospheric CO2 concentration versus pre-industrial levels

45%

of EU surface area is expected to be water scarce during summer by 2030 (30% all year round)

60 years

left until all of the world's top soil could be gone at BAU rate of degradation

Recycling and recovery – Key insights



- 1 Key success factors of a recycling business case are a **steady supply** of end-of-life material of **constant quality** and **stable prices** and an established **market for secondary materials**
- 2 **Pricing true cost of carbon and landfilling** could accelerate the development of the recycling industry
- 3 Even **without additional policy changes**, various **successful examples** show there are plenty of **recycling opportunities** out there
- 4 **Collaboration** between **all actors** along the value chain – **including consumers!** – can greatly **improve collection** rates and secure supply of end-of-life material

Our speakers have proven that innovation can be a driver and enabler of recycling activities



New technology

- **Magpie's** technology enables very high recovery rates over 95% of precious metals in effluents, addressing the \$5.5 bln of precious metals lost each year



New business model

- **Carbon Conversion Technology (CCT)** developed a waste tyre supply chain platform to increase scale and eliminate uncertainty in the supply of end-of-life tyres



New marketing initiatives

- **Decathlon** will launch an environmental impact label to inform consumers about the sustainability performance of each product



New stakeholder collaboration

- **Saint-Gobain** launched the Placo Recycling Program by bringing together the different actors along the value chain and setting up a collaboration with 100 partner to organise the collection



New policies

- **Sociedade Ponto Verde** studied the potential impact of different government policies/actions on waste collection, recycling and recovery, incl. an Extend Producer Responsibility Program Trial

Eco design – key insights



- 1 The design phase **impacts each step of a product's life cycle**, therefore eco design is by definition **cross-disciplinary**
- 2 Eco design has proven to **provide fuel to designers** and their creativity, enabling them to **turn around** this new design **constraints into innovation and business opportunities**
- 3 Eco-design can be a **reaction to regulation**, but if you invest in eco-innovation driven by the **search for economic benefits, competitive advantages and true care** about the environment, bigger benefits will be achieved

Our speakers showed how eco-design can drive innovation

Examples

Design constraint



- Reduce energy consumption and use of scarce materials in computation and data storage



- Reduce environmental impact of cars throughout their entire life cycle



- Design and produce light weight products based on sustainable production process



- Produce a sustainable Insulation material based on renewable material and a low-emission production process



- Remove constraints of material forming process to broaden the possibilities for designers

Innovation

- **Innovative research** by learning from most powerful “computer”: our brains

- Significant **reduction of the environmental impact** of the Peugeot 308 across its **entire life cycle**

- First, and so far only, to apply **chromium-free** process for aluminium degreasing, anticipating EU regulation

- New Golbey plant is **25 times less CO₂-intensive than** average wood fibre boards plant

- Viscoplastic forming process **enables new designs and the use of previously unusable materials** with low energy requirements and no increase in costs

Value chain management – key insights



- 1 Rather than just looking at the performance of materials and components, it becomes more and more important to **understand, control and communicate** about the **entire product life cycle**
- 2 This requires **a holistic approach** to track the materials and components from initial extraction to end-of-life recovery and treatment
- 3 Which on its turn requires **collaboration/ cooperation/ coordination** between **all actors along the chain**
- 4 Closer collaboration and better understanding of the entire value chain often leads to various **value creation opportunities**: e.g., improve efficiency, stimulate innovation, reduce environmental impacts, etc.

Our speakers illustrated the growing importance of understanding, controlling and communicating about the entire product life cycle



- Italcementi has taken an end-to-end approach to assess and pursue the sustainable practices in each step of the cement chain



- ESCP stressed the importance of collaboration between the different actors along the value chain



- Valspar indicated the important role innovation can play to improve the value chain impact and competitiveness of companies



- IUCN brought together the key leaders in the aluminium value chain to establish the Aluminium Stewardship Initiative (ASI)



- Larsen & Toubro have improved the life cycle impact of a Process Gas Boiler System by conducting a detailed life cycle analysis

Looking forward ...

- China will soon pass US and EU and have the most stringent pollution regulation for cars
- Without significant improvements in energy consumption of data storage, the next generation of super computer might need the energy supply of an entire power plant
- Saint-Gobain will reduce non-recovered waste 50% by 2025 and achieve 0 non-recovered waste in the long term
- Pavatex will launch wooden insulation materials that « does not burn »
- Decathlon aims to have 30% of its products eco-designed by 2017
- ...



We would like to thank all speakers for the interesting presentations and engaging discussions!

Thanks!

