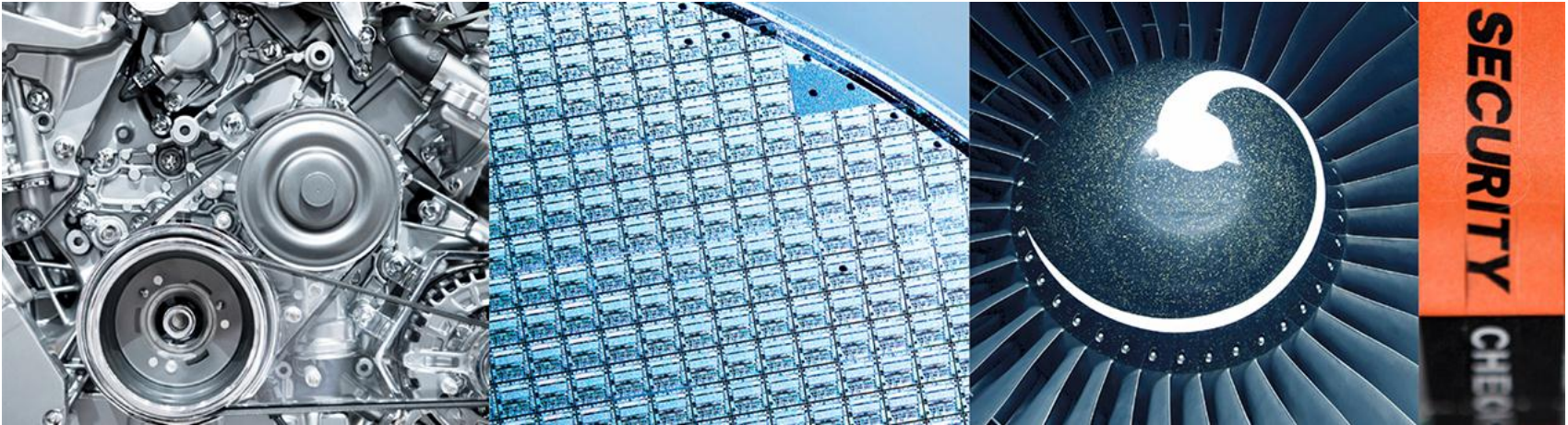


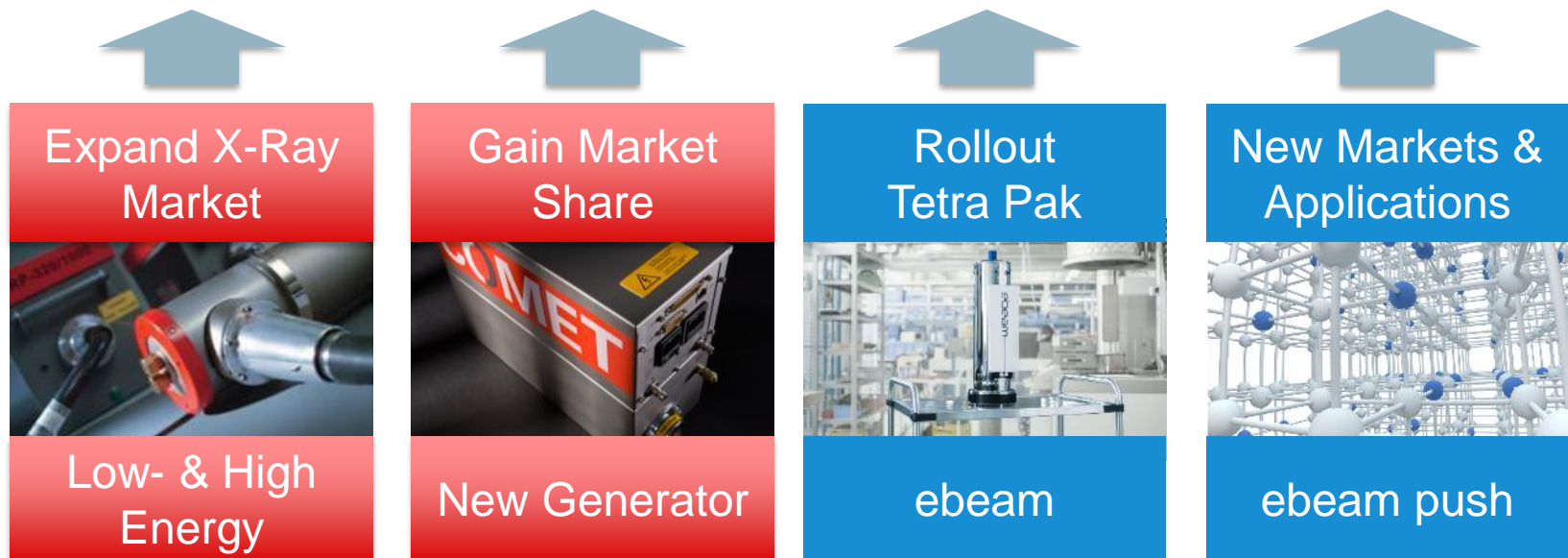
Growth through new customer segments and markets



Charles Flükiger
President Industrial X-Ray & ebeam Technologies

The growth is based on 4 pillars

Growth is based on our leading technologies and products



COMET

ebeam

How to develop new markets based on existing technologies: Example “Sorting / Mining”



**Industrial Waste
Sorting**



**Electronic Scrap
Sorting**



Ore Sorting



**Automobile
Recycling / Sorting**

Main focus areas

- Mineral Sorting (ores, diamonds, coal)
- Recycling (metal, glass, plastic and organics)

Facts of interest

- Recycled material sorting (metal, wood, plastic, organic waste)
- There are more than 12'000 auto recyclers in US
- There are 24'000 coal mines worldwide
- Diamonds are mined in 21 countries – DeBeers with ~40% share

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How to develop new markets based on existing technologies: Pipelines

Trend: Film to Digital
Requirement: Small Focal Spot with Power
Technology: X-Ray replaces Isotopes

The handling of isotopes is highly regulated
Using isotopes leads to high overhead costs

- Background checks
- Disposal costs
- Transportation



How do we get best out of ebeam?

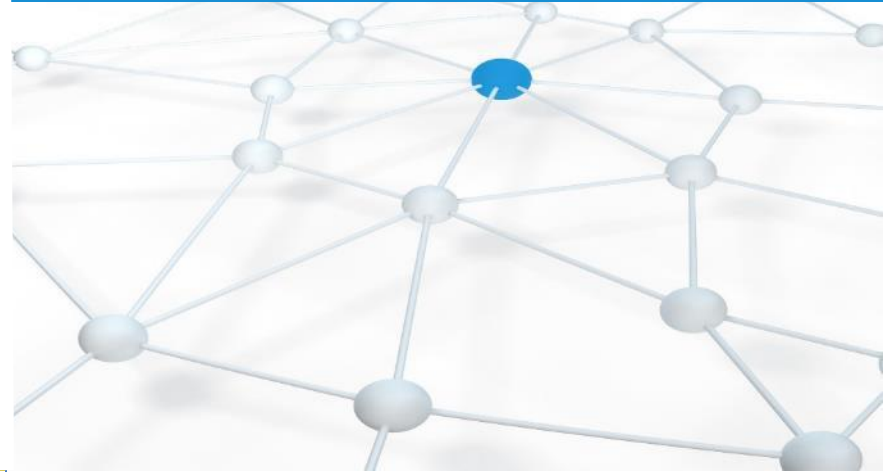
We focus on Tetra Pak rollout & we push new applications!

Rollout Tetra Pak



- Technology implementation on Tetra Pak system platforms
- Industrialization and preparation for volumes

New Applications



- Screen for new applications
- Partner up with key customers
- Application development and validation

What benefits do you get with ebeam Technologies? ebeam offers four major benefits for a better world!



ebeam increases the world's food supply by extending its shelf life.



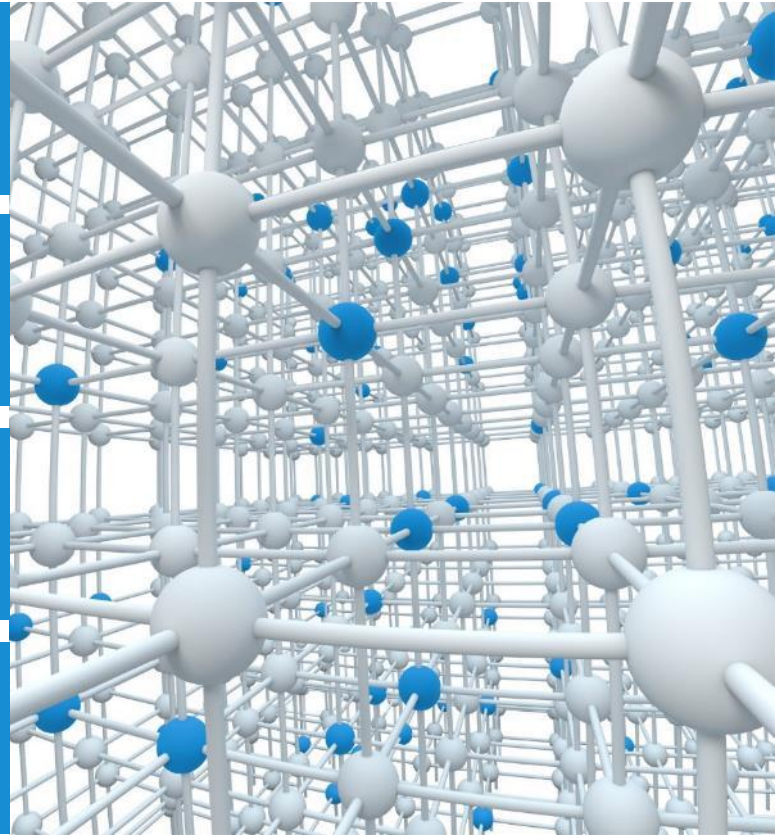
ebeam reduces energy consumption in certain industrial processes by 50–80 %.



ebeam replaces toxic chemicals in industrial processes.



ebeam enables the creation of new materials and the UPcycling of old materials.



What does ebeam actually do?

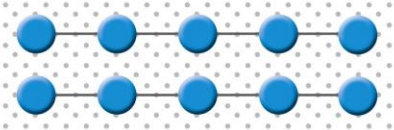
There are 3 fundamental physical effects...

Break a bond and then ...

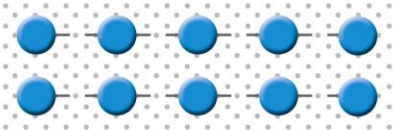
A

... leave it broken.

after



before



usage

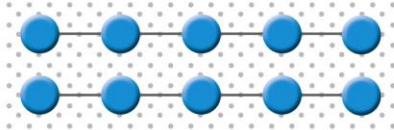


Examples: sterilization and biomass upcycling

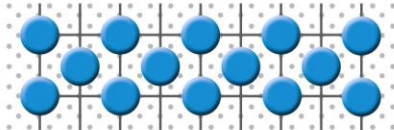
B

... let it bond to itself.

after



before



usage

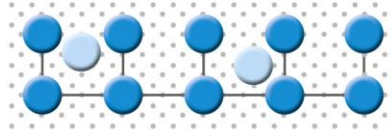


Examples: curing of inks, crosslinking of packaging material and cables

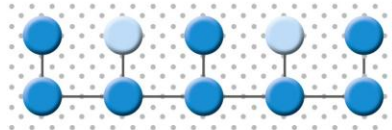
C

... let it bond to something else.

after



before



usage

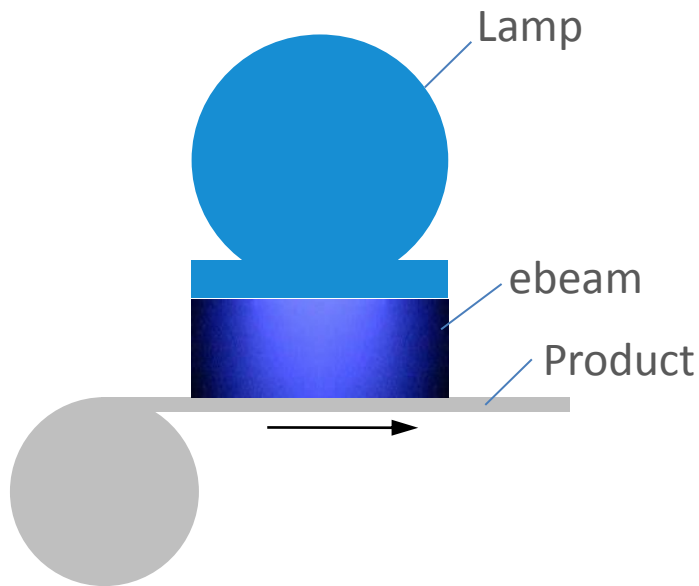


Examples: reactive compounding, grafting of biocompatible materials on membranes

What products will enable new applications?

Three very different product concepts are under way!

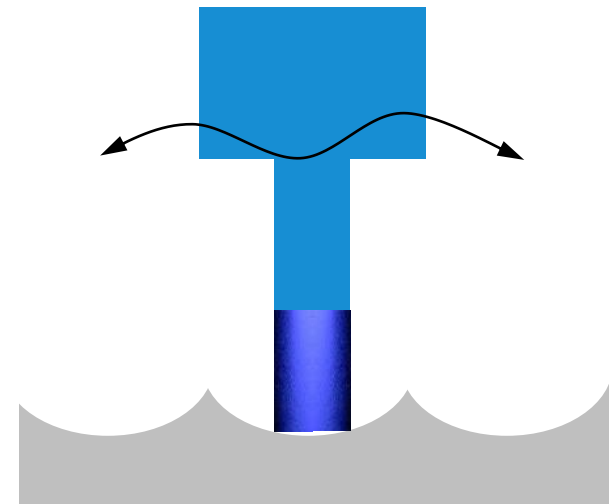
EB Lamp for beaming
flat surfaces
Available



EB Lamp for beaming
cavities
under Development



EB Lamp for beaming
uneven surfaces
under Development



With what challenges are we faced with?
Scale the technology to higher energies and power!



Challenges

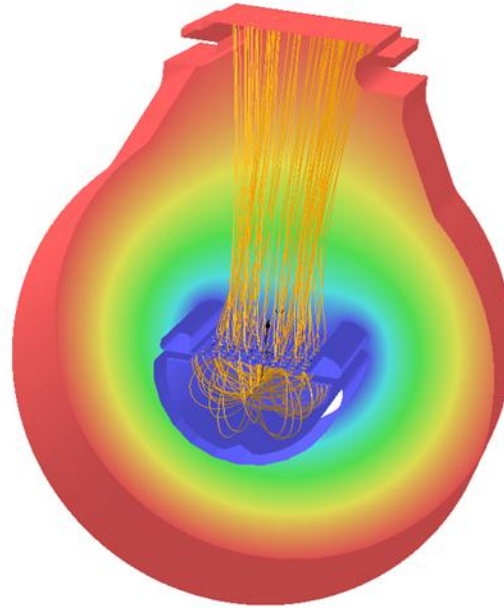
Energy	200	→	300kV	for more penetration
Power	4	→	20kW	for higher throughput
Beam length	400	→	1200 mm	for wider webs

How can we avoid bottlenecks to ebeam Technology?

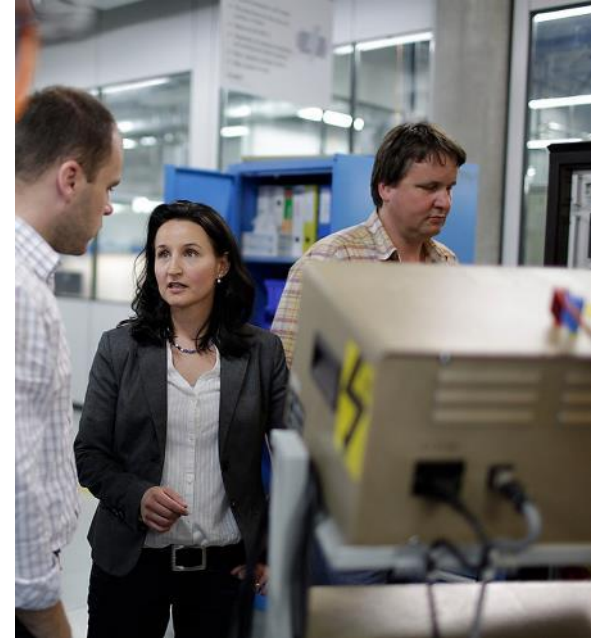
Via easy access through 3 channels!



EB Lab:
The easy-to-use
R&D tool



Quick answers via
computer simulations



Easy access to App
Labs in all regions
(available in 2014)

How do we ensure effective deal-flow and build trust? With experienced people and a unique BD process!

1. Evaluation of Market Segments

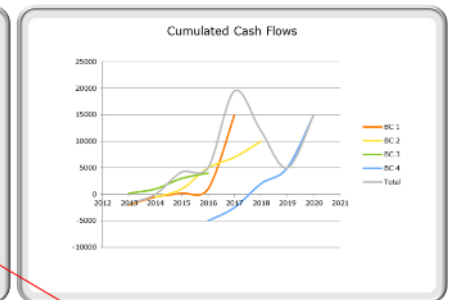
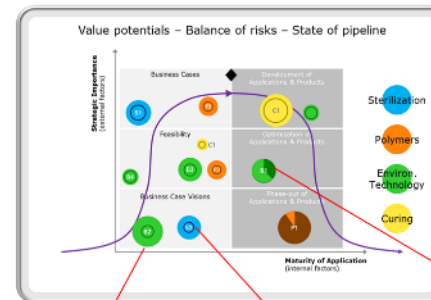
2. Creation of Business Case Visions

3. Demonstration of Feasibility

4. Definition of Business Cases

5. Development of Products & Applications

- **Effectiveness:**
A structured process for an effective business development for the ebeam technology, i.e. defining a portfolio of business opportunities for the organic growth of ebeam and managing this portfolio by means of periodical evaluations with regard to its effectiveness
- **Build Trust:**
By using a systematic, standardized approach for business development, the stakeholder's trust in the ebeam organization is generally strengthened
- **Training:**
The process serves for the training of new employees of ebeam's business development team and provides a guide for the daily work of the business developers
- **Controlling:**
The process forms the basis for the controlling and management of the ebeam business case and project portfolios
- **Transparency:**
The process' deliverables allow for a differentiated stakeholder transparency



Bubble Area represents the **cumulated Cash Flow Potential (CFP)** of a business case

Inner Circle represents the **risk-adjusted CFP** (i.e. small inner circle → high risk)

Dark Pie represents the **realized cumulated Cash Flow**

Why do we focus on 4 market segments?

Because they have best potential and keep us focused!

VP, Business Development

Sterilization



Environmental
Technology



Curing



Plastics



Frontiers



Customer
Experience

Marketing & Business Communication

Order Management & Special Logistic Projects

Applications Engineering & Customer Integration

Who will execute this plan?

Key experts are on board and committed



experts with more than 150 years of experience in our chosen 4 key market segments








Core team focusing on 10y supply chain concept and Tetra Pak rollout



Focusing on new product concepts for new applications

Why is time-to-money different from case to case?

It depends on application development and validation!

A	1-12w	Simulations Demos Replacement	
B	3-9m	EB Test Unit	
C	1-3y	Application based on existing products with ebeam reference application in the industry	
D	3-5y	Application based on product modification without ebeam reference application in the industry	
E	>5y	New application based on new product concepts	

Summary

1

Innovative Technologies

- High and ultra-high power tubes (HP, UHP)
- High energy (450-800 kV), **low energy (30-100 kV)**
- **Generator (Trinity)**
- **Intelligent x-ray source (iVARIO)**
- **ebeam**

2

Strong Growth

- **Launch of the new line of generators in 2014-2016**
- Scaling of existing product innovations (high and **low energy, e-beam**) through product variants for **new applications (e.g., sorting)**
- Optimization and expansion of sales channels in Asia
- Optimization of business and marketing communication

3

Emerging Business

- Focus on Rollout Tetra Pak
- **Accelerated development of the ebeam business**

4

Operational Excellence

- Paperless processes, reduction of interfaces
- Further reduction in throughput time (one shot), yield optimization (yield management), expansion of drop shipping
- Cost-effective design (new generator line, ebeam emitter, packaging)