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

Expand X-Ray Market
Low- & High Energy

Gain Market Share
New Generator

Rollout Tetra Pak
ebeam

New Markets & Applications
ebeam push
How to develop new markets based on existing technologies: Example “Sorting / Mining”

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

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
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...

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>leave it broken.</td>
<td>... let it bond to itself.</td>
<td>... let it bond to something else.</td>
</tr>
</tbody>
</table>

**before**

**usage**

- Examples: sterilization and biomass upcycling
- Examples: curing of inks, crosslinking of packaging material and cables
- 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**

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>200</td>
<td>300kV</td>
<td>for more penetration</td>
</tr>
<tr>
<td>Power</td>
<td>4</td>
<td>20kW</td>
<td>for higher throughput</td>
</tr>
<tr>
<td>Beam length</td>
<td>400</td>
<td>1200 mm</td>
<td>for wider webs</td>
</tr>
</tbody>
</table>
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!

- 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.
Why do we focus on 4 market segments? Because they have best potential and keep us focused!
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!

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1-12w</td>
<td>Simulations Demos Replacement</td>
</tr>
<tr>
<td>B</td>
<td>3-9m</td>
<td>EB Test Unit</td>
</tr>
<tr>
<td>C</td>
<td>1-3y</td>
<td>Application based on existing products with ebeam reference application in the industry</td>
</tr>
<tr>
<td>D</td>
<td>3-5y</td>
<td>Application based on product modification without ebeam reference application in the industry</td>
</tr>
<tr>
<td>E</td>
<td>&gt;5y</td>
<td>New application based on new product concepts</td>
</tr>
</tbody>
</table>
Summary

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

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

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

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)