

Customised Power Electronics for E-mobility

100% CLIMATE NEUTRALITY, INTERNATIONAL CONFERENCE

October 4-5, 2017, Sønderborg, Denmark



PASSION FOR
POWER ELECTRONICS

Design and manufacturing of
customized power electronics

CONVERDAN

ENGINEERING



Customised Power Electronics for E-mobility

1. Short introduction to Converdan Engineering
2. The New Product Development Deadlock
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Converdan Engineering

One-stop Shop for power electronics design and manufacturing

Converdan offers services in power electronics, ranging from custom product design to prototyping and sub-contract manufacturing of finished products.



Business Areas

Industrial



Renewables



Power Quality



E-mobility



Power Supplies



Learn more at:
www.converdan.com

The New Product Development Deadlock

New business areas -> new products – however:

New products require investment in R&D

Investment requires the opportunity for Return On Investment (ROI)

ROI = (gain from investment – cost of investment) / cost of investment

If there is no significant business or market demand, ROI and risk is not proportionate (payback time approaches infinity)

!! DEADLOCK !!

Subsidiaries can be used to inflate market demand (increase possible gain)

What if we could also lower the cost of investment?

How to Lower Cost of New Product Development

How to Lower Cost of investment in New Product Development:

Use funding (not really lowering costs, but just making others pay)

Realize that Time-to-Market is key so you:

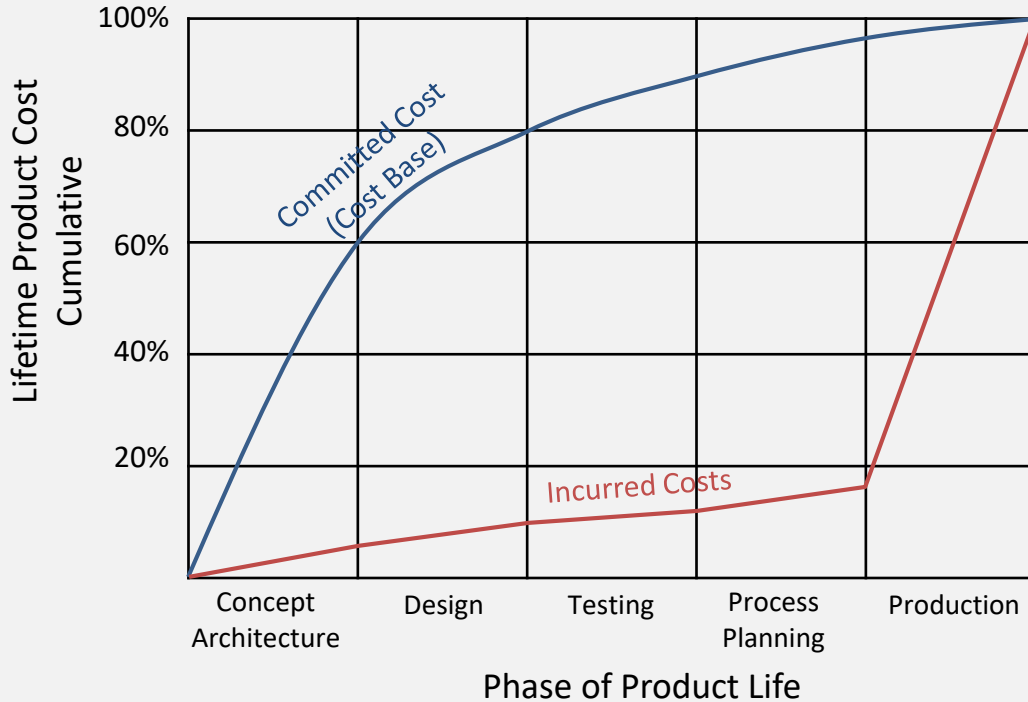
- Go for a *minimum viable product* (less performance than you really need), and don't waste time talking with potential customers about it
- Move quickly forward by immediately jumping to detailed design
- Cut corners to stay on schedule
- Postpone efforts to reduce cost – we can easily reduce cost later!
- Neglect safety and other legal demands (CE, WEEE, RoHS etc.)
- Rush market introduction, and don't waste time on test and validation
- To achieve quality: We later find out what is wrong, and then fix it

How to Lower Cost of New Product Development

That is the perfect solution if you have customers who:

- Don't care about product performance meeting demands
- Don't care about the price
- Don't care if it is illegal or in fact un-safe to use the product
- Thinks it is interesting to unwillingly be part of the field trials, and experience the uncertainties related hereto
- Find it interesting to be involved in realizing quality issues and to follow as they are being resolved (if they are being resolved)

A Little-known Fact about Product Lifetime Cost

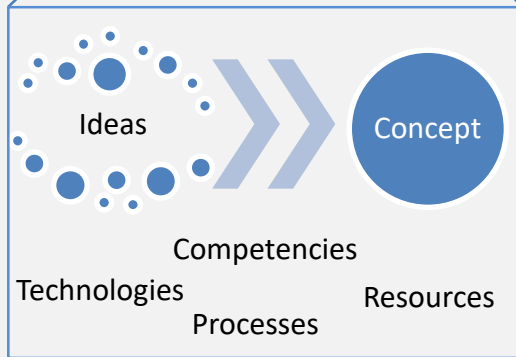
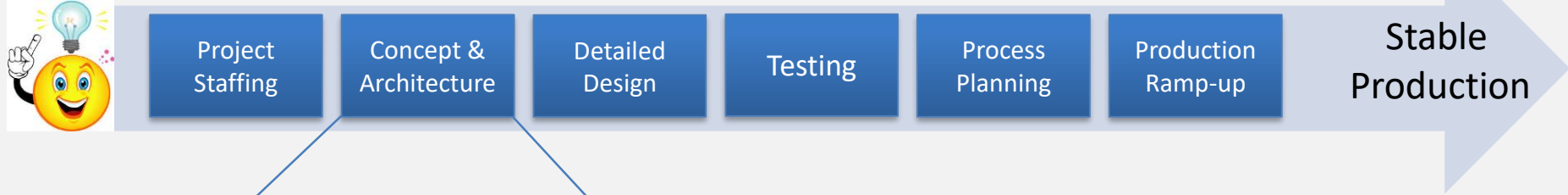


Once in production only 5-10 % of cost base can be affected.

90-95 % of product cost base is determined by the engineering phases.

Traditional New Product Development

Time to Market > 12-36 months

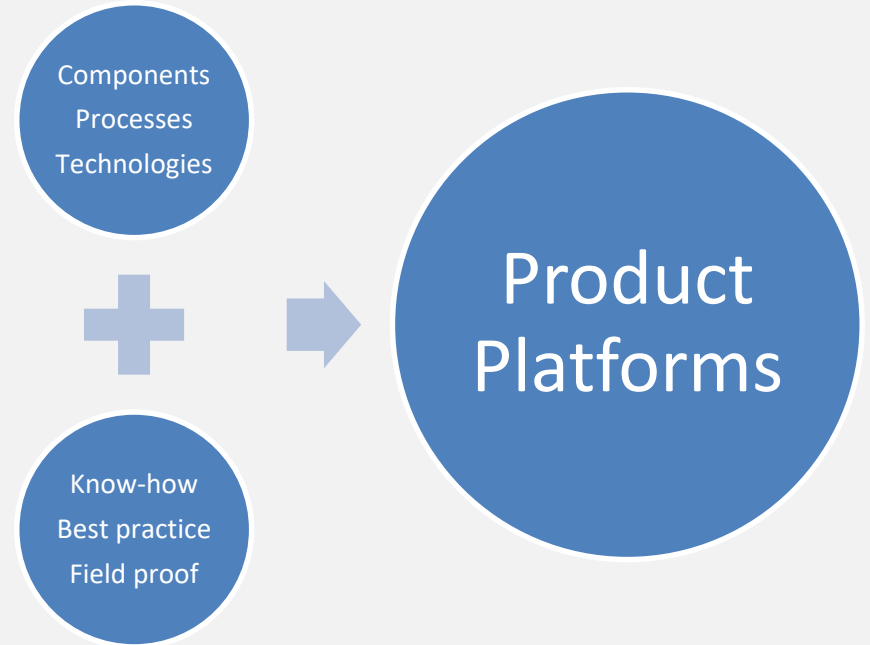


- *Time-to-Market* is long!
- *Project Risks* are considerable!
- *Investment* is huge!
- *Lean manufacture* is not easy at *low volume*

Platform Based New Product Development

How to achieve:

- **Short Time-to-Market**
- **Low project risks**
- **High product quality**
- **Lean manufacture**
- **Low Product Lifetime Cost**
- **Low Initial (project) cost**



Platform Based New Product Development

Time to Market < 3-9 months



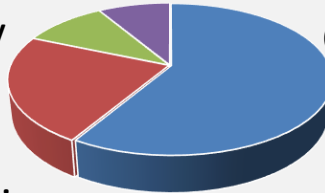
Implementation
Test

Stable
Production

Product Platform
(Design blocks + Implementation Processes)



Technology
Purchase
Test
Field experience



Components
Process
Know-how
Best practice

Continual
Improvement

Engineering cost is
shared between
multiple projects ->
Depreciated over
several products

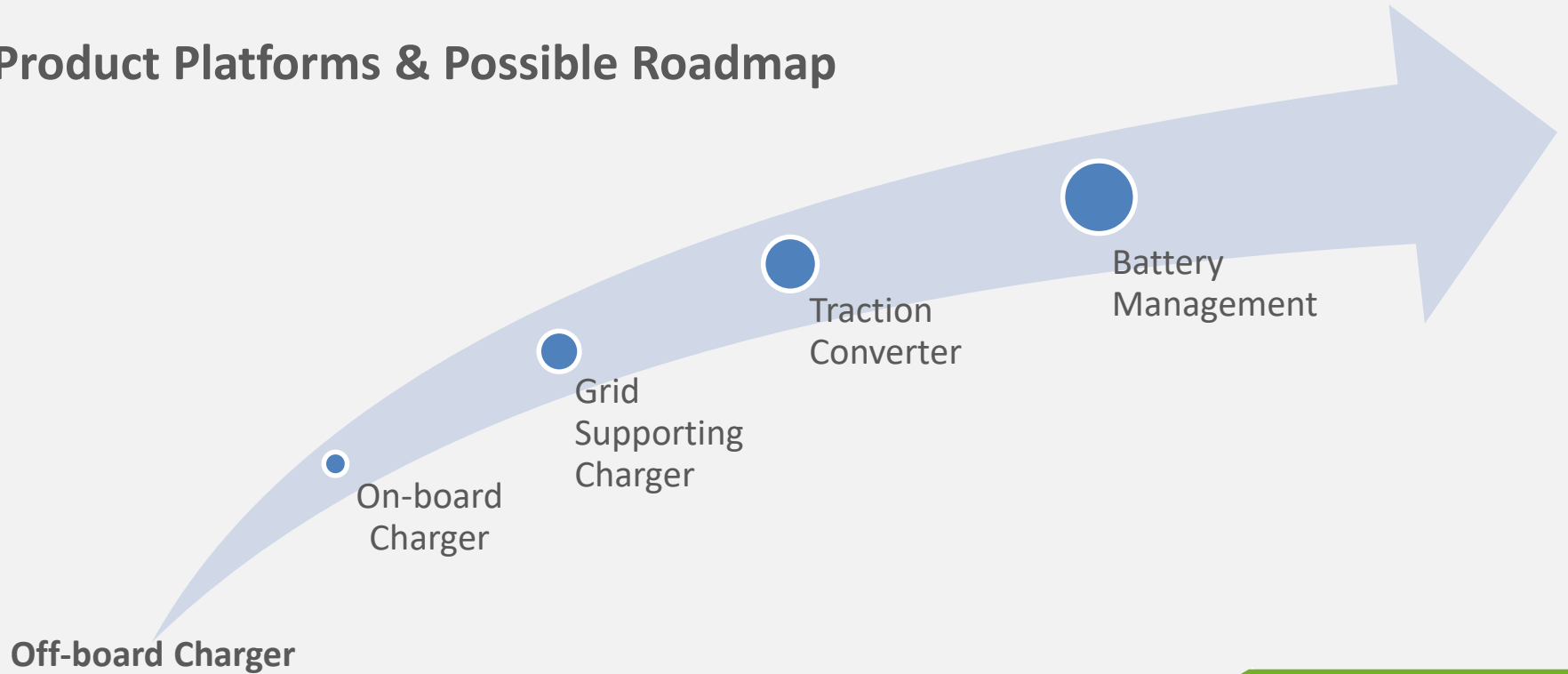
Platform Based New Product Development

Benefits from using platforms for customizable products:

- Very short time to market
- Very low project risks
- Based on field-proven and trusted technology
- Fully industrialized design from day-one ensures:
 - Lean manufacturing
 - High product quality
 - Low or no requirements for specialized test and burn-in equipment.
 - Cross product pooling of component purchases yields lower prices, especially at low to medium volume
- Product lifecycle support at a fraction of the cost
- “Mix and match” selection of design blocks across application areas

Product Platforms for E-mobility

Product Platforms & Possible Roadmap



Questions and comments ?