



ROUTES TO MARKET FOR ENERGY INNOVATORS

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What drives energy innovation ?

- ◇ Improvements in efficiency, reliability and cost
 - ◇ Reduction of technical losses
 - ◇ Automation and control
 - ◇ Better quality of supply
 - ◇ Driven by competition/profit, at least in part
- ◇ CO₂ emission reduction
 - ◇ Incorporation of renewable energy into generation
 - ◇ Electrification of heating and transport
 - ◇ Improvements in efficiency
 - ◇ Driven mostly by policy

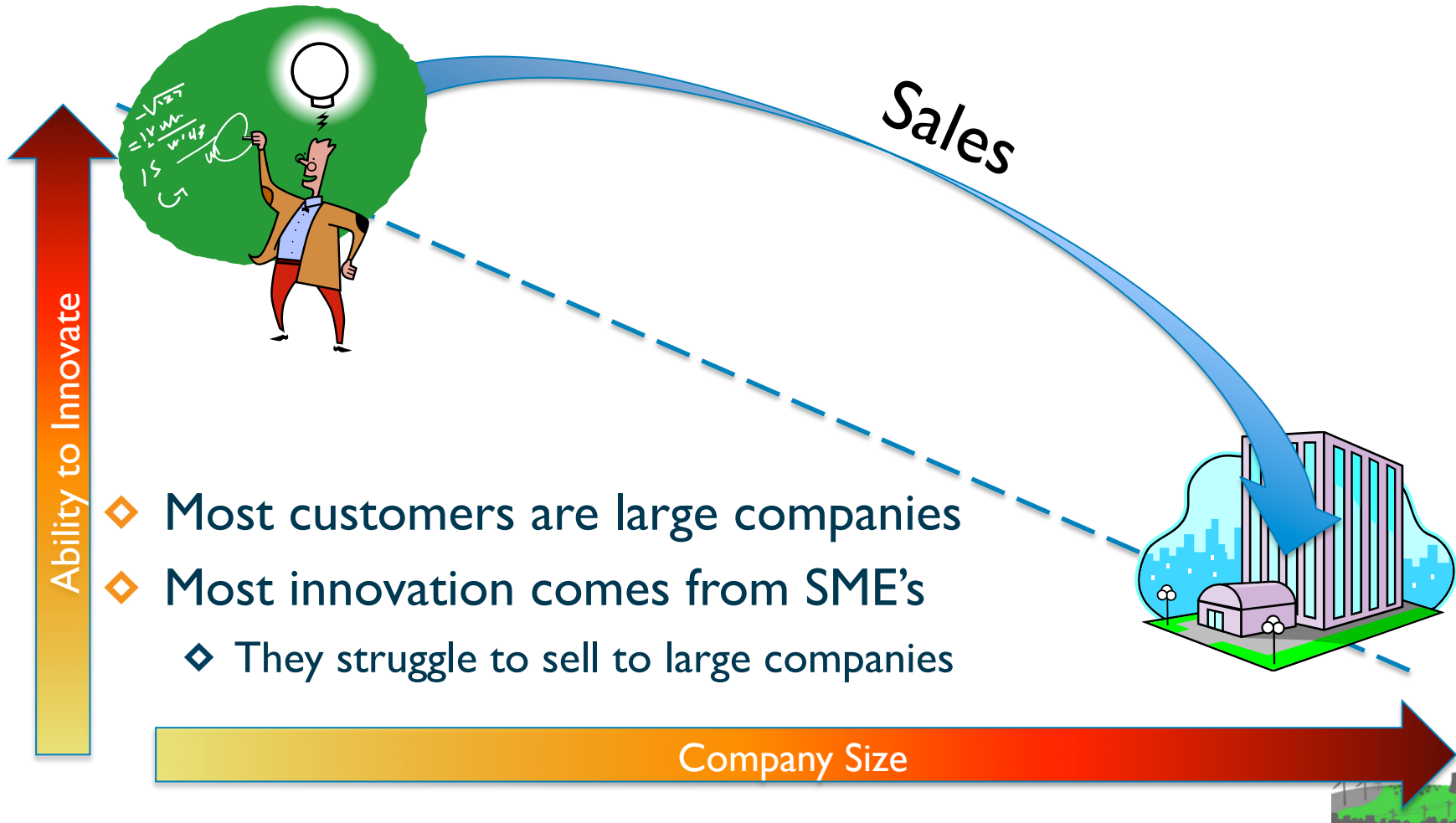


What limits rate of energy innovation ?

- ◇ Speed of technical innovation ?
 - ◇ No !
- ◇ Commercial and financial constraints
 - ◇ Regulation and inertia
 - Large infrastructure businesses are slow to change
 - Regulatory cycle is long and rigid
 - ◇ Poor linkage between investment and financial return
 - Structural – benefit is diffuse across multiple players
 - Complexity – multiple business cases across different functions
 - Financial – low carbon technologies generally cost more

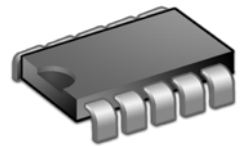


Energy innovators and their customers



Alternative routes to market

- ◇ License an enabling technology
 - ◇ License to established large manufacturer
 - ◇ Help manufacturer to design product
 - ◇ Collect royalty
- ◇ Components
 - ◇ Sell a key enabling component
 - ◇ Get manufacturers to make and sell products that use it
- ◇ Joint ventures
 - ◇ Partner with a large business to sell to large energy businesses
 - ◇ Jointly create and sell products



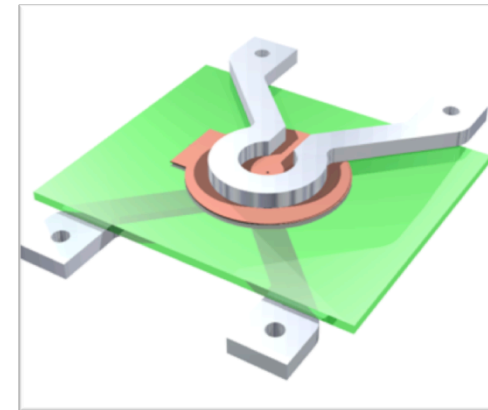
IP licensing

- ◇ Innovations must be in the form of patents
 - ◇ These can be pending patent applications
 - ◇ Main claims must be clear and unambiguous
- ◇ License end-manufacturers
 - ◇ They already have market access
 - ◇ They can achieve scale
- ◇ A typical licence deal would include
 - ◇ An up-front technology access fee
 - ◇ A small royalty on each product sold
- ◇ There are many variables
 - ◇ Territory, exclusivity, field of use, term, etc



IP licensing example

- ◇ Current sensor for electricity meter
 - ◇ Enabling \$5 saving for US-style electricity meter
 - ◇ Enabling class 0.2 accuracy
 - ◇ Patented by Sentec in 1999
 - ◇ Licensed exclusively to Invensys in 2000
- ◇ Products
 - ◇ 4 generations of electricity meter
 - ◇ Numerous product variants
 - ◇ Products still being built, now by Sensus
- ◇ Revenues
 - ◇ Over \$10m licensing revenue generated for Sentec



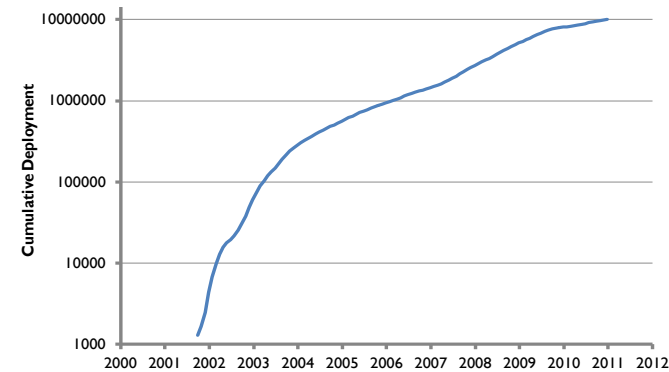
IP licensing – good and bad points

◆ Advantages

- ◆ Low capital and low risk to innovator
- ◆ Long-term revenue streams are possible

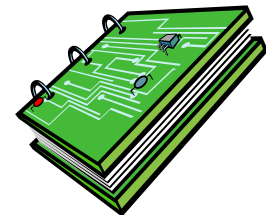
◆ Disadvantages

- ◆ Hard to sell the licence
 - Manufacturer takes all the risk up-front
- ◆ Complex commercial deal
 - Long negotiations
 - Slow sales process
- ◆ Deals need to be large to be worth it
 - As patent/legal costs can be significant



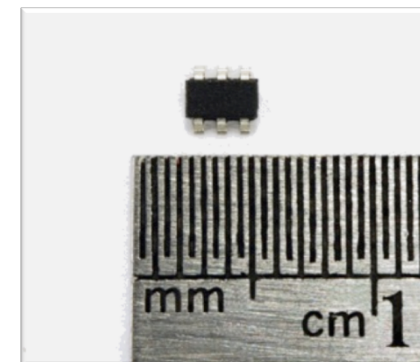
Exploiting innovation: components

- ◇ Design a key component
 - ◇ Ring fence the innovation in the component
- ◇ Find a route to manufacture
 - ◇ Contract manufacturing
 - ◇ Third party making similar products
- ◇ Create reference designs using the component
 - ◇ Evaluation kits, simple products
- ◇ Sell components to end product manufacturers
 - ◇ With appropriate margin
 - ◇ Direct sales, catalogues, distributors



Component example: MicroMonitor

- ◇ Target end products: ubiquitous low-cost energy monitors
 - ◇ Goal: built into every appliance or lead
- ◇ Key component
 - ◇ Energy measurement and communications protocol IC
 - ◇ Tiny package, minimal additional components
- ◇ Manufacturing route
 - ◇ Existing semiconductor manufacturer
 - ◇ Customised version of one of their existing chips
- ◇ Sales channel
 - ◇ Direct engagement with energy monitor manufacturers



Components – good and bad points

◆ Advantages

- ◆ Manageable product development costs
- ◆ Not dependent on obtaining broad patent coverage
- ◆ Simple commercial model for product manufacturers
- ◆ Extensible business model – new components
- ◆ Wide range of products may result



◆ Disadvantages

- ◆ Revenue stream may be short lived (product lifecycle, IP)
- ◆ Share of final product margin may be small
 - Depending on relative value/complexity of component



Innovation: joint venture

- ◇ Partner with a large organisation
 - ◇ Complementary skills – e.g. manufacturing
- ◇ Jointly create new products
 - ◇ Share the product development effort
 - ◇ Provide the innovation
- ◇ Market and sell the products
 - ◇ Partner has sales and marketing capability
 - ◇ Partner contracts with end customers



Joint venture example: GridKey

- ◆ Low-voltage network monitor
 - ◆ Customers: Distribution Network Operators
- ◆ Innovation: retrofittable without interruption
- ◆ Partnership between Sentec and Selex ES
 - ◆ Sentec manufactures innovative current sensors
 - ◆ Selex ES manufactures electronics
- ◆ Results in UK
 - ◆ 5 out of 6 DNO's are customers
 - ◆ 800 systems installed to date
 - ◆ Best system in independent testing



Joint venture: pro's and con's

◇ Advantages

- ◇ Successfully overcomes barrier to sales
 - Commercial terms
 - Warranties
 - Credibility

◇ Disadvantages

- ◇ Large investment in product development
- ◇ Margin shared with JV partner
- ◇ Culture clash with large JV partner



Innovation winners and losers

◆ Winners

- ◆ Solutions that generate “enough” benefit
- ◆ Commercial deals that encapsulate the benefits
- ◆ The first solution that generates customer traction



◆ Losers

- ◆ The “best” technology, but with no customer traction
- ◆ Solutions where the route to market is blocked
- ◆ Innovations with diffuse benefits
- ◆ Mandated or regulated solutions





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