DISCLAIMER: THIS IS NOT A PITCH....
• Rasmus Schmidt Davidsen, 30 years old
  • Post Doc, DTU Nanotech
  • Co-founder, Black Silicon Solar
Nanostructures...
...width of human hair!
making silicon black...
...anti-reflective!
SOLAR
23,000 TWy/year

2009 World energy consumption: 16 TWy/year

2050: 28 TWy

25-70 per year
WIND
Waves: 0.3-2

3-11 per year
OTEC

2 - 6 per year
Biomass

3 - 4 per year
HYDRO

0.3 - 2 per year
Geothermal

215 total
Natural Gas

240 total
Petroleum

90-300 Total
Uranium

900 Total reserve
COAL
...approaching ‘grid parity’!

Kilde: Nature (2016)
Big future market

Source: IEA
Apply in the solar industry

≈ 40 process steps

Wafer → Cell → Panel

Texturing × → Junction formation → Parasitic junction removal → ARC → Contacts printing → Firing of contacts → Testing/sorting

BLACK SILICON
Why I am here?!
Pitching

Goal: 2\textsuperscript{nd} meeting (or date!) – get people interested
Tell a good story...
But how?

Rules (of thumb):
• Limit technical details to an ABSOLUTE MINIMUM – 1 slide!
• A picture says more...

• Tell ’em what you want to say
• Say it
• Tell them what you just said

One-liner
• We make_____ by______ in order to ______

• We make SOLAR CELLS BLACK by ETCHING NANOSTRUCTURES in order to IMPROVE EFFICIENCY AND LOWER COST
Elevator Pitch sentence structure:

FOR (target customer), WHO HAS (customer need), (product name) IS A (market category) THAT (one key benefit).

UNLIKE (competition), THE PRODUCT (unique differentiator).

solar cell manufacturers Have

Too high production cost per Watt

Black Silicon

Texturing technology

Makes solar cells better and cheaper

Most solar technologies

Is a simple, scalable and applicable 1-step process
No-go’s
(believe me, I’ve made them all..)

• "We have no competitors…"
  – How is it done today (conventionally)?
    Who could potentially solve it in the future?
    Who could be interested in you not doing it?

• "We don’t need investment..”
  – Patents, Sales & Marketing, Salaries...
"Recipe"

Big perspective: HUGE Problem, HUGE Potential

Details: Technical explanation

Value Proposition: Business model; $$, Market etc.

Big perspective: Solution to HUGE problem = HUGE POTENTIAL (Hollywood one-liner)
From David S. Rose, serial entrepreneur and investor

Logical progression
Things I know or understand
Validators

Things I know are not true
Things I don’t understand
Things that make me think
Internal inconsistencies
Typos, errors, unpreparedness
Tips and Tricks
Make good slides (!)

- Simple, avoid fancy fonts, colours etc.
How to be “on stage”

• Speak up, slowly and clearly
• Open, positive body language
• NEVER:
  – Hands in pockets
  – Crossed arms
  – Standing still OR running around
  – Look at computer
The Hook

3.869 \times 10^{26} \text{ Watt}

More energy per day than all humans combined consume in one year...

1.000.000.000.000 tons of CO$_2$

More CO$_2$-emissions than all cars in New York City...
The Solution

• What do you do?!

• Are you solving the customers pain?

• Nice to have or need to have?
The Business Model

Bad Company, Inc.

Supplier 1

Customer 1

Customer 2

Customer 3

Sub-supplier
The Business Model

- Use LOGO’s
- Keep it simple
- Understand your own model:
  - Customer?
  - Partner?
  - Value Chain?
The Market

• Preferably increase (past+future)

• Total vs. Target Market

Solar Cells, Europe $32 Billion
Solar Cells, Europe $6 Billion
TARGET

European silicon solar cell manufacturers
Value Proposition

• Quantify:

<table>
<thead>
<tr>
<th>REC factory in Singapore:</th>
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</thead>
<tbody>
<tr>
<td>Yearly Production</td>
<td>347 megawatts</td>
</tr>
<tr>
<td>Black Silicon Solar cost saving</td>
<td>3%</td>
</tr>
<tr>
<td>Yearly gross saving</td>
<td>14 million USD</td>
</tr>
<tr>
<td>Capital Investment</td>
<td>-3 million USD</td>
</tr>
<tr>
<td>Royalty fee BSS</td>
<td>-3.5 million USD</td>
</tr>
<tr>
<td>Net saving Year 1</td>
<td>7.5 million USD</td>
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</table>

Reference: Assuming module prices at 1.51 USD per watt with 12% gross margin (Suntech Annual report 2011)
Put things in perspective...

Approximate production cost

- Paste: 4%
- Process materials: 2%
- Power: 1%
- Invest Equipment: 5%
- Invest Facilities: 2%
- Labor (Europe): 5%
- Wafer: 81%

Saving

<table>
<thead>
<tr>
<th>Raw material (silicon)</th>
<th>15-20% thinner wafers</th>
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<tbody>
<tr>
<td>Reduced process cost</td>
<td>Potential 10-25% lower cost</td>
</tr>
<tr>
<td>Improved efficiency</td>
<td>0.5-1% improvement (absolute)</td>
</tr>
<tr>
<td>Reduced CO₂ emissions</td>
<td>Up to 75%</td>
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</tbody>
</table>

3-6% panel cost saving

Trina Solar Gross Profit Margin Quarterly Chart
Validation

• Customer Validation is THE BEST

• Quotes from external experts, requests from customers

• If others have invested, bought, joined... MENTION!

Dr. Sun, CFO of Trina Solar:

"Cost savings of 2% or more are very valuable for us"
Asking for money...

• Timeline + milestones

• How much?
  - 1 Mill. DKK too little
  - 1 Bill. DKK too much!
    (typically)
The Team

• Both tech and business represented

• Senior Advisors **important** (25 years experience in industry etc...)

  - If Bill Gates is on your board, everybody wants to join!
Competition

• Make competitive landscape

• Mention "unfair" advantages:
  – 200% better
  – 1/10th of the cost
(you get the point!)

<table>
<thead>
<tr>
<th></th>
<th>Efficiency</th>
<th>Cost</th>
<th>Material Use</th>
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<tr>
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<td>?</td>
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I hope you ”caught” my pitch...
EXERCISE 😊

• Make one (or more!) one-liner(s) about YOUR company/project/product/idea…