

Overcoming Project Finance Issues for Commercializing a New Technology



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What does it take?

- ▶ Viable Technology
 - ▶ Economically
 - ▶ Technically
- ▶ Talented Developer
- ▶ Receptive Market
- ▶ Creative EPC
- ▶ Engaged Funding Source(s)





Moving the ball forward

Technology Breakthroughs*

- ▶ Super conductivity – cool helium to -425°F and it has zero electrical resistance
- ▶ Super Fluidity – cool helium to -456°F and it has zero viscosity and zero resistance to flow



So can we devise a way to make projects “flow” forward with minimal to zero resistance? A standard process to follow?

* The Disappearing Spoon: And Other True Tales of Madness, Love, and the History of the World from the Periodic Table of the Elements*, Sam Kean 2010

NO !

It takes a general path with lots of FLEXIBILTY



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Technology

- ▶ Having the best mouse trap isn't enough
 - ▶ Extensive pilot testing (10,000 hours +)
 - ▶ Small-scale commercialization
 - ▶ Can you get a client to host a small semi-commercial unit? (Siluria)
 - ▶ Alternatively build a small commercial facility (Velocys)
 - ▶ Small-scale commercialization is frequently a prerequisite to financing a full-scale commercial unit
 - ▶ Limit scale-ups to a maximum factor of 10X
 - ▶ Have strong performance guarantees for the new technology
 - ▶ EPC generally has a very QUALIFIED guarantee (wrap)
 - ▶ Vendor/Fabricator backing
 - ▶ Gap Insurance (New Energy Risk)





Developer

- ▶ Keeping multiple balls in the air simultaneously
 - ▶ Funding: Equity/Debt/Grants/Gov't Incentives, etc.
 - ▶ Technology development
 - ▶ Commercial Agreements (Feedstock, Product, Land)
 - ▶ Government Agreements
 - ▶ Environmental requirements
 - ▶ EPC – managing the “gates” and financial demands
 - ▶ Etc.
- ▶ Not an expert of anything, excellent generalist and Executive Manager





Market

- ▶ Is there a demand for the product?
- ▶ Is the Market receptive?
 - ▶ Are there creditworthy customers ready and willing?
 - ▶ For FT jet fuel, think airlines
- ▶ Are there regulatory hurdles?
 - ▶ Recall what happened to tetra ethyl lead in gasoline
- ▶ What are the alternatives?
 - ▶ Is there a compelling argument?
 - ▶ Cheaper?
 - ▶ Performance?



- ▶ Need reputable EPC in front of the banks
- ▶ EPCs don't truly understand what a developer is going through (but they think they do)
 - ▶ Tendency toward condescending attitude
 - ▶ Focus on selling hours, not solutions
 - ▶ Note: I work in the Business SOLUTIONS Group
- ▶ Developers typically don't know how an EPC works or what they offer
 - ▶ Thus they make fundamental errors that waste money/time such as:
 - ▶ Avoiding early stage studies (trying to save money)
 - ▶ Over constraining technology options/process choices
 - ▶ Or the flip side; running too many cases trying to "over-optimize"





Funding

- ▶ Find equity and debt partners that know this business
- ▶ Some underfunded Developers have difficulty acknowledging that they won't keep majority control of "their baby"
 - ▶ Those with the money, rule
- ▶ Frequently Developers are visionaries – which doesn't translate well into good management
 - ▶ Professional management may be imposed by Financiers
- ▶ Early money (high risk money) commands strong returns/ownership
 - ▶ The balance of "get enough money, but not too much" (it's really expensive money) is difficult to find
- ▶ It's easier to get \$1B once you have a construction agreement with a wrap (guarantee) than it is to get the first \$10MM at kick-off





How to “Reduce Resistance”

- ▶ In an ideal world, very early, the Developer identifies each party
 - ▶ Equity, Debt, Technology, Gap Insurance, EPC, Counterparties
 - ▶ Identify roles and issues
 - ▶ This takes time (years) and multiple meetings
 - ▶ Create a detailed game plan to address and resolve issues
 - ▶ Example: Wrap vs Financing Requirements vs Gap Insurance

- ▶ Don't put the cart in front of the horse
 - ▶ Example: going straight to FEED w/o a feasibility study of some type





In a Nutshell

- ▶ Getting new technology projects completed with financing is a long and difficult road
- ▶ Getting financing requires:
 - ▶ Good commercial data on the new technology
 - ▶ Long-term commercial agreements with creditworthy counterparties
 - ▶ Typically a LSTK EPC contract with a strong wrap
 - ▶ Gap insurance may be needed
 - ▶ A strong developer with excellent management skills



Amec Foster Wheeler is Ready to Help!

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