Alec Brewer <abrewer@ourobio.com>

From FOAK to NOAK

1 message

CTVC <hello@ctvc.co>
To: abrewer@ourobio.com

Fri, Apr 19, 2024 at 12:00 PM

CTVC BY SIGHTLINE CLIMATE

From FOAK to NOAK

By CTVC & David Yeh • 19 Apr 2024

View in browser

Thought we were done with this FOAK series? NOAK! Think again. Before we set you off on your merry deployment way, we've got one more project scaling step left from Pilot to FOAK, now to NOAK and beyond.

At FOAK, definitionally something must be novel — otherwise, it wouldn't be a First-of-a-kind. That novelty can come in the form of the technology, the business model, the application, the geography, or a plethora of other knowns and unknowns. Each dimension of novelty adds risk, and the riskier, the higher the cost of capital. But these obstacles aren't impassable, nor is the journey impossible with the right FOAK financing and the right people, pilots, plan, and partners.

Post-FOAK, what's to show for it? Tens of thousands of hours of consistent operations and product creation. An established track record that can be diligenced, robust partnerships, and proven profitable unit economics. The remaining risks are those common to all new projects; macroeconomic conditions, regulatory changes, suppliers or offtakers going bust, acts of God, etc.

If FOAK crosses the "Valley of Death", NOAK bridges projects to repeatable bankability. Nth-of-a-kind projects that are de-risked at scale are rewarded with access to deep pools of comparatively cheap capital. This may be from institutional infrastructure investors like Macquarie, GIC, Generate, and Brookfield's Energy Transition Fund, as well as, ideally, global asset managers like Carlyle and mega-pensions like CPP Investments. By NOAK, it becomes possible to raise debt (and other credit vehicles) from conservative project finance banks, like MUFG or Santander. By this stage the gates of non-dilutive capital have opened — key to the FOAK-to-NOAK transition. Projects are no longer built with equity, but ideally ~80% debt. Finally, growth doesn't come at the price of dilution.

A NOAK investor speaks a different language than the world of VC: Rather than looking at the *growth* potential of the company, they're looking for *proof* that projects are delivered and operate as intended. Consistently. Again and again. Until underwriting becomes beautifully boring.

This post outlines expectations for companies setting out on the journey from FOAK to NOAK, and some anticipated challenges. Primarily, we explore five areas where change should be expected:

1. 🥅 **Goals**. It may all be about risk, but the risks they're a-changin'
2. 💰 **Finance**. Goodbye TopCo expensive equity, hello project finance and cheap(er) debt
3. 🗂️ **Structure**. JVs, SPVs, OEM, licensing — by NOAK, it's not just about TopCo anymore

4. 📜 **Terms**. Making the FOAK bottomline add up is tough, but by NOAK, there may be alternative options
5. ⚙️ **Product and processes.** Maybe you nailed it the first time, but chances are what you're making and how you make it will evolve and improve until you hit the ultimate goal: standardized modular units

Going for NOAK!

1. 🥅 **Goals**

At FOAK: The goal is to prove that the products/molecules/electrons made at small scale can be made at commercial scale, from reliable supply chains, and sold and delivered to a market that wants them. Technology risk is often talked about first, but equally important is developing creditworthy commercial agreements and demonstrating product market fit. Scale is moot if no one wants it.

At NOAK: The expectation isn't just that it's worked once, it's that it works reliably in different situations. While FOAK just proves it can work, NOAK requires showing it always works, so much so that it's "boring." Easy to build, easy to finance. A fully de-risked project model is when all you have to do is rinse and repeat.

What to watch:

- One is the loneliest number: Doing projects serially can lead to the "Valley of Loneliness". This can be avoided by working on projects in parallel, which likely requires a project development team, rather than an individual. As NOAK veterans say, it gets easier after FOAK but incrementally so.
- FOAK is context-specific. If you expand to a new geography, use your technology in a new application, or make any other meaningful alteration, in the eyes of investors you'll be bringing risk back in and so in some ways be FOAKing again.

- The fine print of de-risking reads: All risks are owned, contracted, and possibly insured against, by the relevant parties. The EPC owns project delivery risks, suppliers own supply chain risks, and offtaker contracts ensure buyers. It doesn't mean no risks exist.

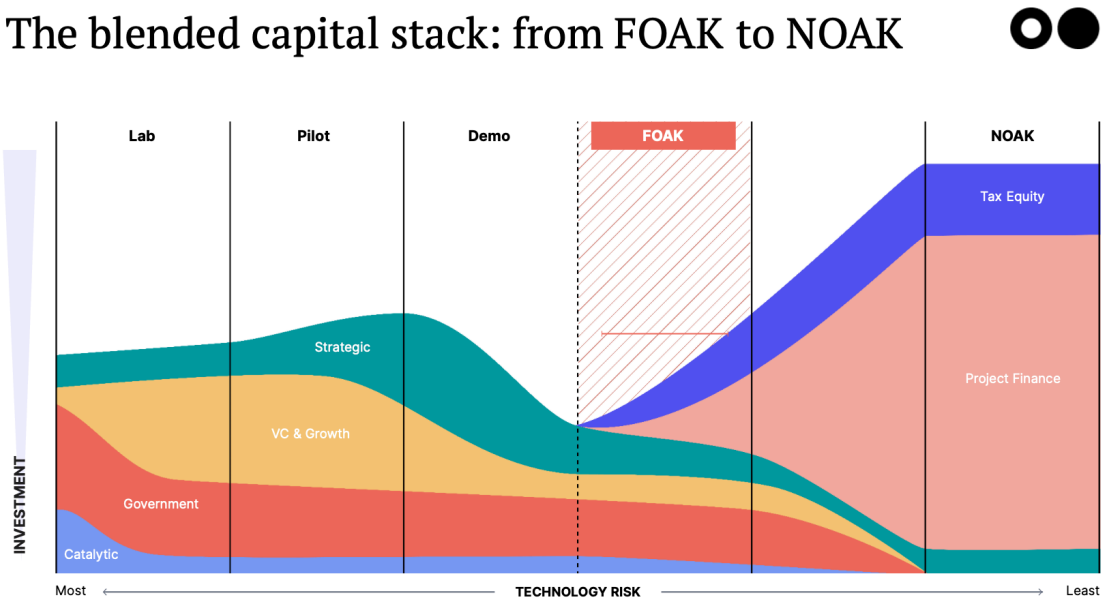
2. 💰 **Finance**

At FOAK: As we covered in our last post, financing FOAK is hard. The combination of high risk and high capital requirements means FOAK financing falls between growth equity and project finance. Typically FOAKs, as well as second-of-a-kind (SOAK), and third-of-a-kind (THOAK) projects, blend several sources of capital.

At NOAK: As indicated in the chart below, by NOAK project finance dominates, along with support from tax equity in the US and some investment from strategics.

What to watch:

- FOAK finance is finicky. Our third piece in this series on FOAK financing covers more.



Capital availability against project stage (Source: Sightline Climate)

The chart suggests how the blend and availability of capital changes over time. The split between the colors at each project stage represents which types of capital are most available at which stage, while the total height of the stack at each stage indicates the relative availability of capital; the higher it is, the easier it's likely to be to access.

As a refresher, "catalytic" refers to patient, risk-tolerant, concessionary, and flexible investment capital, while "VC & Growth" refers to venture capital (investing in early-stage companies) and growth equity (funds investing in growth-stage climate tech companies or acquiring controlling stakes in climate tech companies). Strategics are corporates, like O&G or industrials, scaling up direct investment. Government includes non-dilutive government grants and loans, typically from the DOE in the US. With tax equity, tax credits can be monetized as an offset to the taxpayer's tax liability. Project finance consists of a number of different types of capital, including debt (maybe 60-80%) and equity (20-40%).

3. 📁 Structure

At FOAK: The project may technically be run by a subsidiary of the company though a special purpose vehicle (SPV) for the project, or in rare cases, developed directly by the topco. Either way, it'll likely be topco staff who are developing and then operating the project.

At NOAK: Before you know it, your tech-led startup has grown up. A much wider range of structures and models become possible, such as:

- Companies will set up an SPV to develop projects. Unlike at the FOAK stage, this company will have its own distinct staff from the topco.
- Joint ventures (JV). As your pipeline grows, the transaction costs of doing a bespoke financing and development for each new project gets expensive in time and fees. Having long-term financing and execution partners minimizes friction between project development, financing, and execution. This can happen at FOAK, but becomes more common as project pipelines grow.

- Whatever the legal vehicle, by NOAK, a buffet of revenue and go-to-market models will be available, including:
    - Projectco or assetco: SPV raises funds to build and operate. See Invenergy.
    - Build and sell (devco): Once the project is at COD or even NTP, you can sell the project or, realistically, a pipeline of NTP projects to asset owners. Developer platforms like Apex or Longroad have scaled by deploying this assembly line of renewable energy projects.
    - Original equipment manufacturer (OEM or Licensor): A goal for many climate tech companies. Once they successfully get to THOAK, they don't *have* to develop projects anymore, but can license the tech. They can go back to their first love of making great tech and be the next Nextracker, Bloom, First Solar, or Enphase.

What to watch:

- Partners matter. There is a short list of developers looking to catalyze a new technology, because developers, like their project finance banker brethren, typically prefer proven, familiar technologies that they can execute with a ctrl-c and ctrl-v approach. Blue hydrogen feels familiar to LNG developers. But for companies wanting to develop a FOAK in an area that doesn't have a close corollary, they may need to look to Me, Myself, and I LLC.

4. 📜 **Terms**

At FOAK: FOAKs generally don't make eye-popping profits for the topco, but the strategy of going from FOAK to NOAK is to be "long-term greedy." Building early projects may require concessionary deals with investors or strategics. This might mean:

- Accepting Rights of First Refusal (ROFR), so that project partners have the potential to balance out a weaker FOAK with a more

profitable SOAK or THOAK.

- Less favorable contractual terms. Companies should manage their revenue expectations. The outside investors may have preferred returns, which means they get first, seconds, and maybe thirds on project cashflows to hit their hurdle IRR, before the developer gets a bite.

At NOAK: As we get to “boring and bankable,” everybody eats. With proof of commercial model, greater volume, and plenty of existing successful plants to point to, it should be easier to attract favorable terms with offtakers and suppliers. As well as being possible, it may also be necessary. Infra investors are specifically looking for ironclad contracts to protect against volume and commodity risks.

What to watch:

- Get creative. Sometimes the reason a FOAK is possible is because of innovation in financing and commercials, as shown in the case studies below.
- Just because something’s available on a spot market doesn't mean supply contracts aren’t needed. If there’s the possibility that something could go wrong, like a sudden price surge due to a shipping container getting stuck in the Suez Canal, then that risk will get priced into the cost of capital, an addition many FOAK/SOAK/THOAK projects can't afford.

5. ⚙️ **Products & Processes**

At FOAK: Stepping up to commercial scale sometimes necessitates doing things differently. That might mean changing processes so it doesn't require the lead engineer to be there at all times, or changing inputs because it turns out using a certain material just isn’t cost-effective at scale. From FOAK to SOAK to THOAK, development processes may evolve with learnings from each project applied to the next, hopefully, reducing costs and time frames as you go.

At NOAK: Processes are tried and tested. There are training courses in how to set up and operate your facilities. Crucially, the facilities being built, or products or output produced (depending on your tech) are moving towards modularity and standardization. Modularity enables meeting a range of size requirements by adding units together. It also allows focus on a smaller number of products, ideally one, which in turn sharpens the learning curve, driving down costs faster. Standardization involves producing units according to established norms, ensuring compatibility with other technologies and products, thereby simplifying usage for clients and boosting demand.

What to watch:

- The metrics that matter; internal rate of return (IRR), Multiple on Investment Capital (MOIC), debt service coverage ratio (DSCR), number of operational hours, unit production rates, unit costs, and any impact metrics, will all matter at both FOAK and NOAK. It's not that the metrics themselves change, but their values and consistency. For example, at FOAK you may be keeping an eye on hitting a thousand operational hours without issue, but by NOAK it may be a hundred thousand.

FOAK ➡️ NOAK

	FOAK	**NOAK**
🥅 **#goals**	Just get it built	Print money
💰 **Finance**	No PF for you. Expensive growth equity with strategics and government funding	Bankable with established infra investors, ~80/20 debt to equity
🗂️ **Structure**	Owner=developer=tech supplier=you	Techco, Devco, Assetco, JVs, SPVs
📜 **Terms**	Partners have the power, and the terms may show that	Market standard terms and market level returns
⚙️ **Product and**	Evolving and refining mid-flight	Established, modular and standardized, with hundreds of

processes		thousands of operating hours

FOAK Heros: Case studies in NOAKs

Case Study 1 - Archaea Energy

Founded in 2018, Archaea Energy rapidly grew to become one of the largest renewable natural gas (RNG) producers in the US, going public via SPAC in 2021 before being bought out by BP in 2022. While the underlying technology was by no means novel, at the outset their competitors business model was to sell to a transportation credits spot market, Arachea's novelty came by focusing on providing green gas to companies with public net zero targets. The issue was that the spot market price for these credits fluctuated significantly, reducing the ability to predict future earnings, and therefore borrow against them. Moving to longer-term secure offtake agreements enabled Archaea to secure future revenues and borrow against them, in the form of green bonds to get the most attractive rates.

- **So modular they put their name on it.** Archaea rapidly moved to a modular product, the Archaea Modular Design, a priority for BP post-acquisition.
- **Evolving commercial models.** It wasn't until Archaea's seventh project that they signed their first long-term offtake agreement with a utility.
- **Healthy partnerships.** Before BP acquired Archaea, they had a JV together, along with a host of other JVs with their clients. This enabled them to share risks, costs, and revenue. One client and JV partner stated that the internal rate of return (IRR) from their JV was the best return available to them
- **Innovative financing.** As Archaea scaled, their financing shifted from raising money through equity at topco, to borrowing at topco, to raising project debt and getting partner contributions through allocating project equity.

Case Study 2 - Community solar

As well as thinking about companies going from FOAK to NOAK, one can look at whole sectors making the transition too. One example is community solar. Despite the success of utility-scale solar in the mid-2010s, community residential solar presented considerable risks to investors due to its novelty as a business model, characterized by uncertain offtake agreements. Traditionally, onsite utility solar projects are sold to a single, creditworthy offtaker under a long-term contract. However, Generate Capital identified an emerging opportunity enhanced by regulatory incentives and adopted innovative financing structures and partnerships to pioneer community solar in Minnesota.

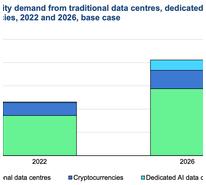
- **Novel partners for innovative financing**. Generate introduced atypical tax equity investors to the solar sector, notably involving an Engineering, Procurement, and Construction (EPC) partner as a tax equity investor—a first-time participant in such a role. This led to the successful development of two projects, each with a capacity of 5MW (Project Murphy and Project Turning). Generate financed the entire construction phase and engaged a third-party customer acquisition manager to secure offtake agreements, aiming for full capacity commitment from the start.
- **Changing terms**. These initial projects were completed on schedule and achieved expected returns on debt, with a regional bank contributing as a financial partner. This success established a strong precedent for subsequent ventures. Over time, as residential solar gained recognition and understanding as an asset class, the cost of financing, including interest rates, fees, and spreads, has significantly decreased. Moreover, the perceived risk by lenders has reduced, allowing for more lenient offtake requirements. Projects no longer need 100% offtake coverage upfront, reflecting Generate's evolution into a more flexible capital partner, with an expectation that offtake agreements will materialize in due course.

Thanks to David Yeh, Missa Sangimino-Ludwig, Natalie Volpe, Deanna Zhang, Chadd Garcia, Scott Jacobs, Jonah Goldman, and Peggy Flannery for their expert advice. And one more huge thanks to David Yeh for making it all the way to this fourth-of-a-kind feature with us.

KEEP READING

🌏 Data center electricity demand goes nuclear #193

Tech companies and utilities cover their bases as data cent…



🌏 $20bn of green for the Greenhouse Gas Reduction Fund #192

A new green bank to finance climate projects

🌏 Stockpiling $82bn of dry powder for climate

$82bn of new capital for climate tech in the past 6 months