

WMF 2024 - How to Pick and Start Green Breakthrough Technologies for the Energy Transition – Key messages

The **Starting Points** :

- Use an expertise developed previously (defense applications for I Pulse or exhaust systems/composite materials for Forvia)
- Build on deep understanding of an industry landscape & identify low competition battlefields (energy consumption of generative AI for Tohoku or opportunity to open a new EV batteries market window for Prologium or recycling of EV production waste for TechMet).

The **Key Challenges** address the ramp up to a reliable technical performance (TechMet for Safety of Battery recycling, Tohoku for Spintronics devices, I Pulse for long life components & simulation tool) , the financing of that ramp up (all), the time to a market acceptable cost (Prologium for SSBs, Forvia for Hydrogen solutions) or the finding/keeping of key partners & team members (all).

We see the **Strategic Plus** as the reasons why those risky bets are (or close to being) successful:

- for Forvia the combination of credible partners for fuel cell stacks (Symbio), 1st orders received from Hyundai trucks, a technical road map to converge on performance and cost and fast investment in production capacities.
- for Prologium SSBs the idea to sell inlays only and cooperate with cell makers to reduce CAPEX and expand the market share as soon as possible
- for TechMet the combination of shareholding in an Energy Metals Platform that allows to precisely assess the availability of base load feed + in a battery manufacturer that allows to estimate the % of manufacturing waste when a battery technology scales up.
- for Tohoku the significant reduction in energy consumption for data storage/processing offered by Spintronics.
- for I Pulse, the synergy between 2 founders with successful experience: 1 in Global/Capex Intensive Scale Up and 1 in High Risk Technology development.

The **Must Do** are a long list:

- Focus on Investments/Technologies that will decrease the cost of your solution and speed up their time to market (TechMet Investing in several recycling technologies in parallel or I Pulse developing Proof of Concepts for several applications)
- Invest on R&D (all), Secure know how and IP (I Pulse) and get industry to collaborate with academia for knowledge and resource sharing (Tohoku)
- Think big from the start (For I Pulse, get BHP, Madden to invest and support breakthrough solutions that allow to explore 30 times faster or grind rocks with much lower energy consumption)
- Think global and "all along the supply chain" from the start (Forvia on market, players, H2 system, techno readiness, supply...)
- Be flexible in capacity building depending on the market and the learning curve of mass production (all)
- Respect discipline in asset management (TechMet funded Li-Cycle' 1st plants in 2018/2019 and divested in 2022 after LiCycle listing and before the Capex intensive roll out of Li Cycle global strategy)
- Anticipate future regulations (all)
- And of course Cash is King- keep on increasing cash reserve for expansion (all)

The **Must Not Do** are straight:

- Never ignore advancements in existing/competing technologies in terms of performance, energy and cost (all)
- Never ignore uncertainties (Forvia) and Never over invest (Forvia or Prologium)
- Never neglect market demands (all)