From **Zero** to **HERO**

6 Steps to Scaling IoT

// Deliver profitable, secure, smart products to market

According to Microsoft's latest IoT Signals report, scaling up challenges are the main reason why IoT projects fail. Successfully delivering a secure IoT product in volume is challenging, and in this dynamic market can mean make or break for your business.

Often, an IoT business model only works at scale. Yet, the technology and the market are both untested at volume. The true cost of investment and resource is often underestimated, as are the risks involved, leading to a loss in stakeholder confidence (and sometimes funding).

As a tried and trusted technology development partner, we've developed smart, secure technology that's in over 30 million homes worldwide - we know what it takes to scale connected devices and systems at mass. We take our customers from idea to concept to millions of deployed products; we know the journey. We help them manage risk, keep stakeholders on side and deliver successful, profitable products to market faster.

58% of IoT projects fail. With our help yours needn't be one of them

Beecham Research 2020

// Quick guide: Here's our 6-step strategy for success

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// A (robust and agile) business case

There's no escaping it; scaling up is time and capital intensive - the amount of time and capital will depend on the product, the specification and the approach.

Sponsors expect a robust business case. But with so many variables and unknowns, it can be hard to define the right approach and quantify the true costs and evaluate ROI.

A lack of foresight and flexibility means many IoT projects are doomed to failure. To succeed where others fail, you'll need to model several scenarios and take an agile approach to development and delivery. That's where we can help.

// Don't forget the OpEx!

You can't plan your ROI if you're not evaluating the operational expenditure that's required to maintain the product at scale over its entire in-field life. This can be where viability and profitability rise or fall. We help customers capture and model lifetime costs to quantify the Total Cost of Ownership (TCO), including:

Connectivity	Management	Feature Updates	Cloud & Storage	Security	After-market Servicing	Reverse Logistics

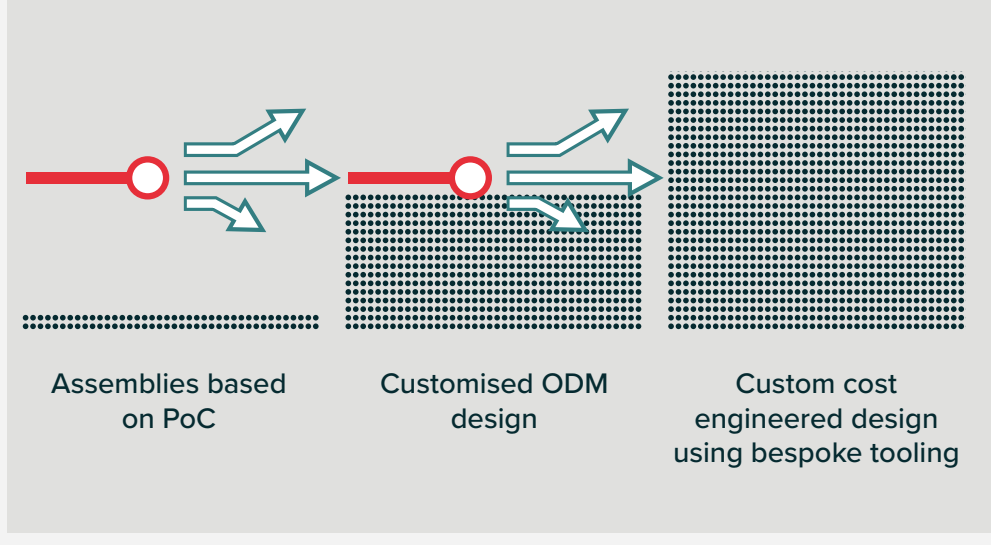### // How much, how long, how many?

It can be difficult to quantify cost and risk when you don't know how many units you'll be ramping up to.

Our **Agile Business Plan** approach identifies 'jumping-off' points between scenarios – 00's, 000's or 00,000's - and captures the capital, timescale and specification trade-offs helping you manage risk and build confidence with stakeholders.

Assemblies based on PoC | Customised ODM design | Custom cost engineered design using bespoke tooling
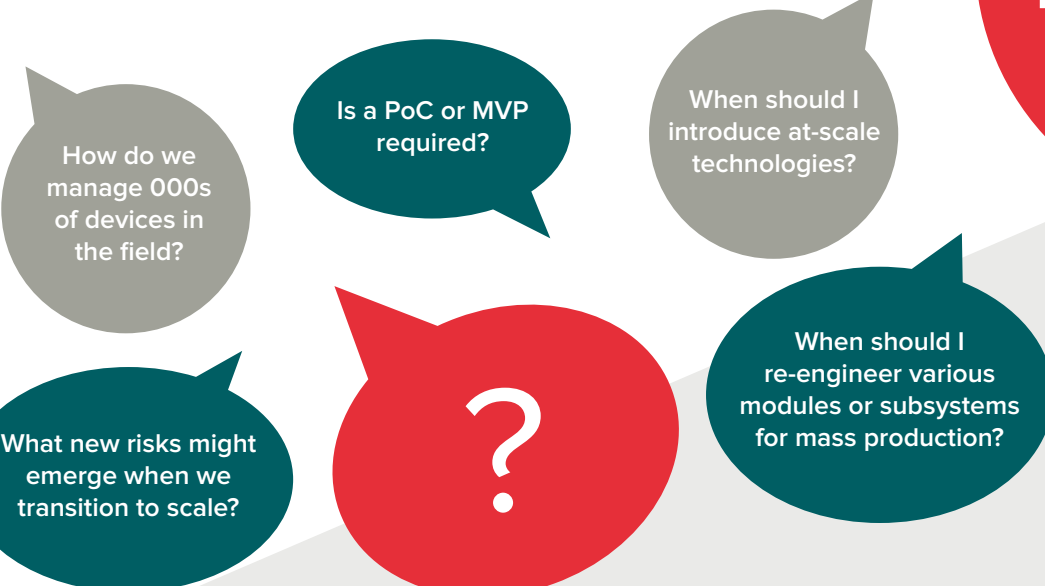
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// The scale roadmap

The economic and technical challenges of deploying 100 units are entirely different to deploying 10,000 or 100,000 units.

Product economics will demand a flexible process that manages technical and market risk while minimising cost.

You'll need a strategy to deliver this, or you risk wasting time and money. Taking a holistic view and making early strategic decisions saves time, minimises risk, reduces cost and avoids re-engineering.
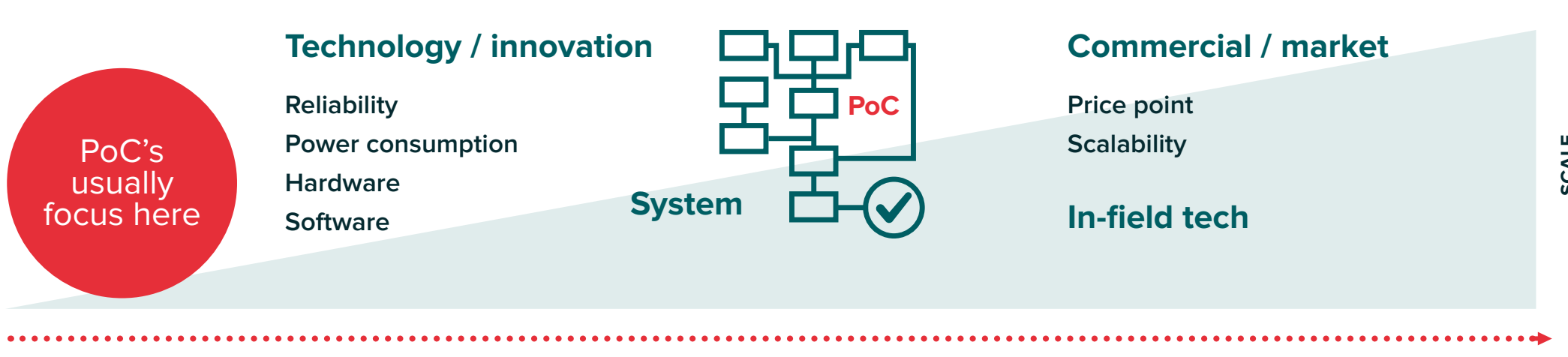
Now's the time to step back and plan the whole journey; we've walked the path hundreds of times and will help you prepare.

We'll help you answer difficult questions

How do we manage 000s of devices in the field?

Is a PoC or MVP required?

When should I introduce at-scale technologies?

When should I re-engineer various modules or subsystems for mass production?

What new risks might emerge when we transition to scale?

?

3

// Proof of Concept (PoC) – What are you trying to prove?

Too often, we've seen PoCs that are too narrow in scope, seeking only to 'prove' a specific innovation. Instead, get the most from your PoC. Before you make a significant investment in building at mass, make your PoC work harder to mitigate risks exacerbated by scaling. Your Scale Strategy (in step 2) identifies risks that could limit your product's ability to scale - be clear what you're proving and align the PoC scope to the scale strategy outcomes.

PoC's usually focus here

Technology / innovation
Reliability
Power consumption
Hardware
Software

System

PoC

Commercial / market
Price point
Scalability
In-field tech

SCALE

SCOPE

By expanding the scope, you can use the PoC to prove at-scale technologies such as system-level and in-field technologies. This will help to mitigate risk and reassure stakeholders and even attract investment.

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// Minimum Viable Product (MVP) – or should that be 'Market Viable Product'?

So, your PoC has established that the technology will work at scale. We need to apply a commercial lens; the front of mind for stakeholders and investors now will be 'will people want it?' Unless an established market has already been tested, your new product will need testing with the market that will use it in the form of an MVP. There's no substitute for honest customer feedback and the market insight that it brings.
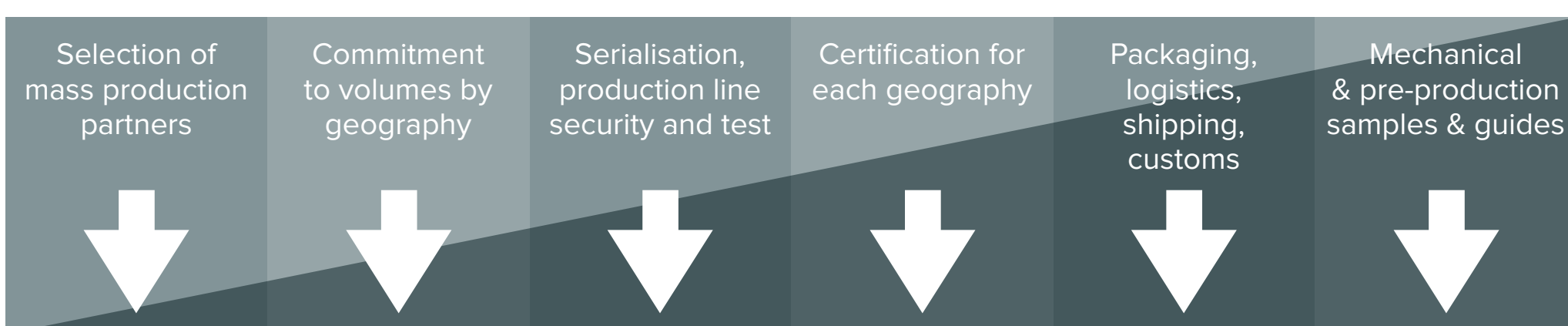
Getting the green light

MVP
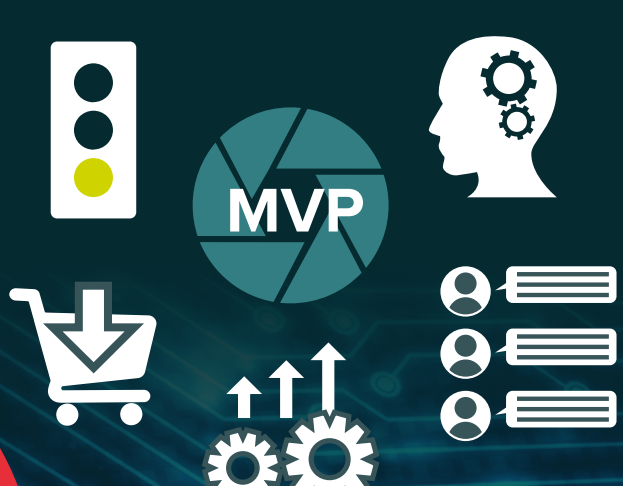
Your MVP may lack the refinement of the scalable product, but it's an important staging post between PoC and scaling (and one that people are most tempted to skip often to their (substantial) cost later down the line). You'll want to consider :

- **Functionality** - does it perform the basics?
- **Communication chain** - edge to cloud
- **Security** model prototype
- **User experience** and interfaces
- **Connectivity** and wireless in the field
- Reconcile **costs** back to the business case

For over 15 years that we've been developing connected devices, an MVP has always delivered insightful, valuable feedback that has minimised cost and delay in the long run.

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// Ramping to scale

As you scale up, so does cost, and getting it wrong is expensive. Unless you're from a very large organisation with deep pockets, you'll likely need significant investment to fund this next stage. That's where experience, along with a solid, robust scale strategy, PoC and MVP will pay dividends. New product introduction is an intense stage of the process involving numerous decisions and approvals, such as:

Selection of mass production partners	Commitment to volumes by geography	Serialisation, production line security and test	Certification for each geography	Packaging, logistics, shipping, customs	Mechanical & pre-production samples & guides

One consideration that is easy to overlook in haste is maintaining product security during manufacture. It is easy to lose track of how secret keys and serialisation data will be handled within the factory. A leak, whether malicious or entirely accidental, could be disastrous. To overcome this, we've developed production line serialisation technology that means confidential data need never be shared with the factory.

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// Operational system

As mass-production transitions into business-as-usual, the focus will shift to the operational system. Project capitalisation will close, and the spotlight will be on managing operating costs, which typically leads to a rolling programme of cost downs, second sourcing and incremental improvements.

Collect insightful data to inform improvements

Tuning in field data gathering and analysis to answer business improvement questions is an ongoing process. For example:

- How much data is sent per month? could we switch from GSM to Lora to reduce cost?
- What latency are we achieving - do we need 5G?

Security & compliance

How will you comply with increasing Secure by Design type regulation? Incoming vulnerability disclosures must be acted upon and a software BOM should be used to pro-actively seek out relevant disclosures.

Upgrades & new features

Innovation and competition move fast. Managed connected devices offer the opportunity for feature upgrades through software updates. It may also be necessary to upgrade security on the devices and systems as well as make disclosures to customers and authorities.

We work with our customers as a trusted partner during the operational stage, helping them as needed to add features, manage security, reduce cost or roll out systems. Using a trusted partner to step in when needed or to handle low-intensity specialist activities helps our customers reduce their operational overhead.

We've helped to develop hundreds of connected devices and systems - from concept to millions of deployed products - for some of the world's largest brands. We know the journey and can help you manage risk and get to market faster.