

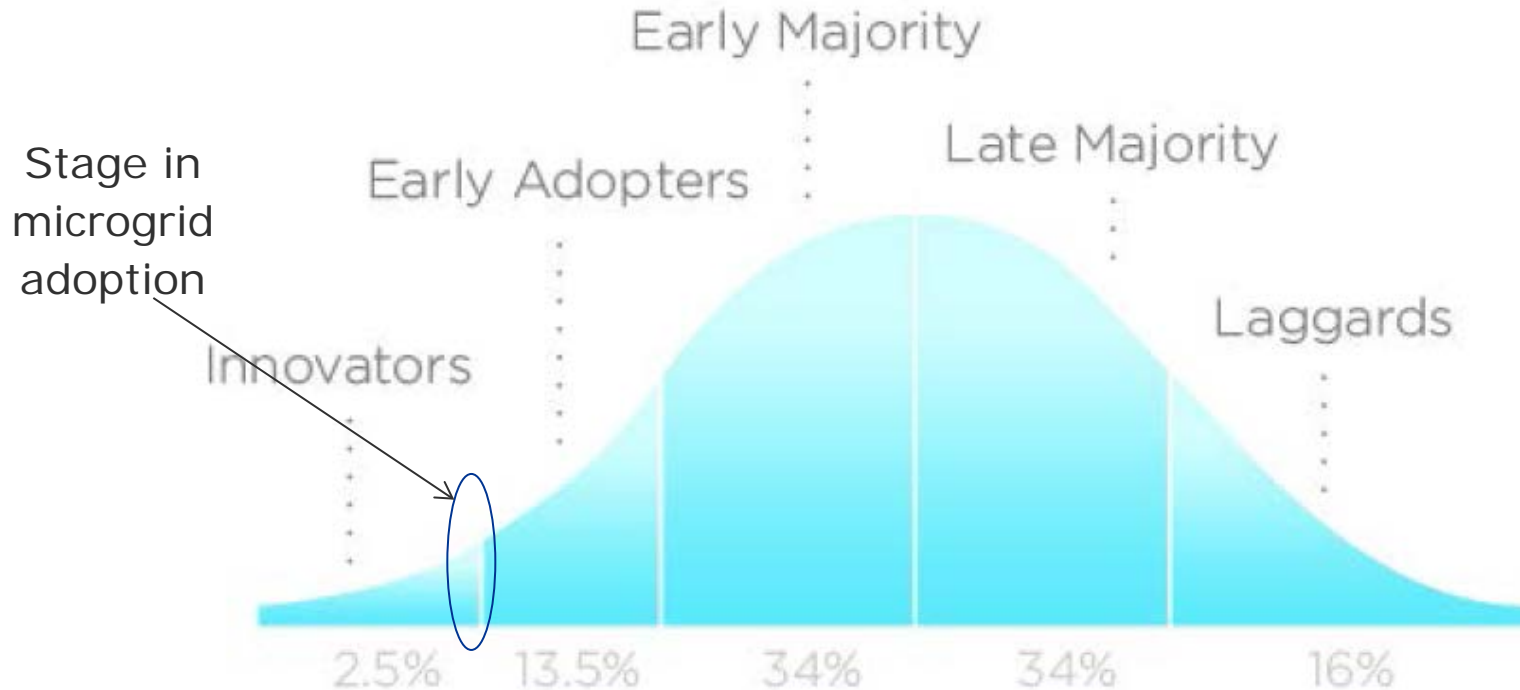
Business Models and Financing for Microgrid Deployment

Nov 06, 2017

Microgrid 2017 Conference, Boston

Microgrid State of Adoption

Innovation Adoption Life-Cycle



- Deployments are accelerating spurred by: reductions in Solar PV and storage costs, state initiatives, federal and state incentives.
- Presently, most microgrids are funded by **public grants and on balance sheet**.
- Expectation is for **lenders** to start investing in microgrids over 2017 – 2022, moving adoption to Early Majority stage.

Emerging Microgrid Project Financing Needs

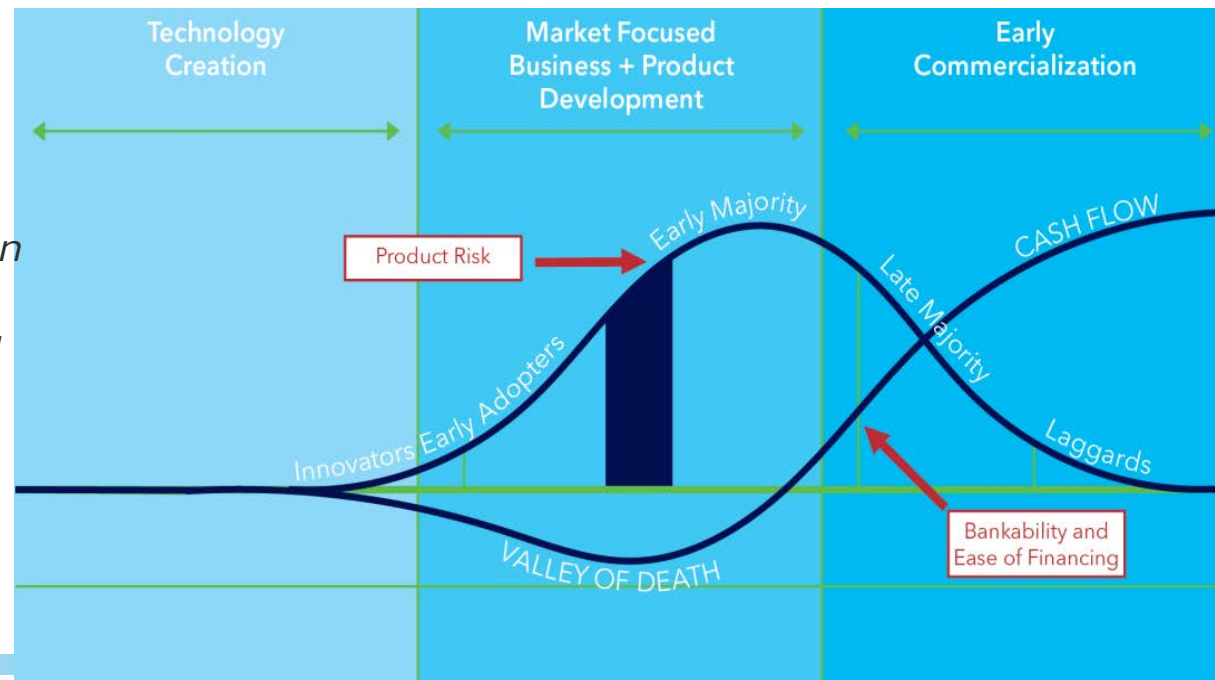
- Microgrid project financing is expected to follow the same path as **Solar, Wind and Storage**.
- Unlike established renewable technology revenue structures, microgrids have the potential to provide **multiple services to different customers**
 - Flexibility provides opportunity and creates risk in realizing full revenue projections
- Market growth depends on understanding and quantifying **technology and merchant risks** to achieve project financing
- Stakeholders in the project lifecycle must address the real or perceived risks in order to achieve their respective returns.



Achieving Bankability of Early Stage Technologies

- Early stage technology is typically funded on balance sheet or through grants in demonstration projects **until the technology and projects are deemed “bankable”**.
- Lenders rely on **3rd party assessment** to identify and mitigate risks.
- As lenders see the **industry accumulate experience** with technologies and new revenue streams, they will become comfortable with its performance record.

Similar to the Technology Adoption Life Cycle introduced by Geoffrey Moore, technology bankability will have to cross the chasm of risk



Monetization of multiple services

How to monetize multiple microgrid services?

Traditional
energy
contractual
model



PPA

Offtaker

Revenue via energy payments

*What would a microgrid
service contract look like?*

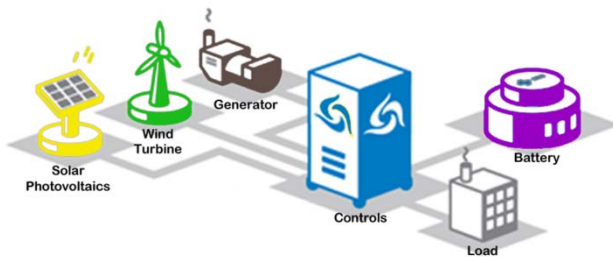


Image Source: Civic Solar

Multiple
revenue
Streams
from
multiple
customers

Energy Sales through PPA

Demand Charge Management

Reliability (Back up power)

**Grid Services (Capacity contract,
intermittency management, asset
upgrade deferral)**

**Wholesale market participation
(generation), Demand Response
Programs**

Thank you

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