



March 17, 2009

Emerging Technologies: What's in in for my customers and me?

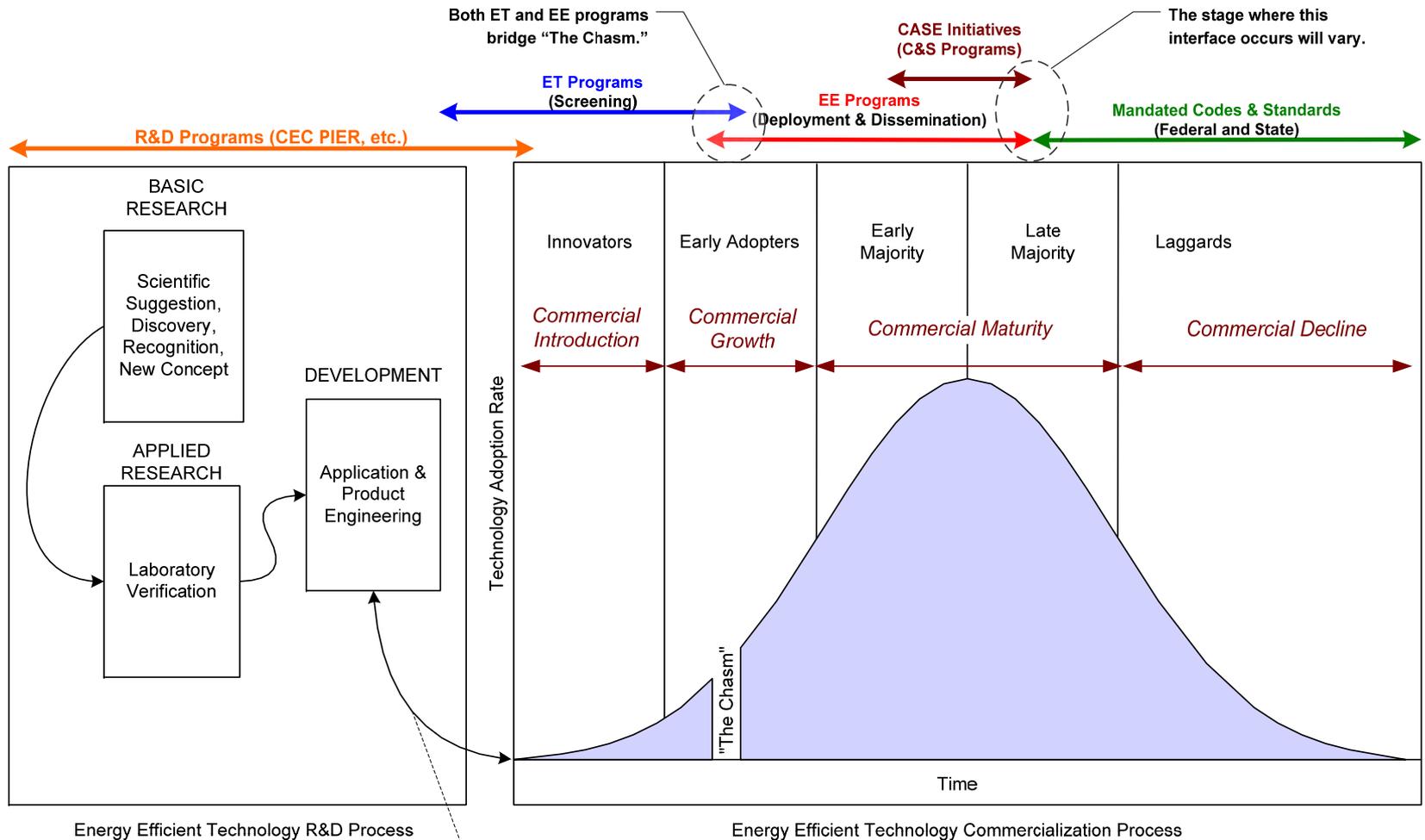
Jonathan Livingston
Livingston Energy Innovations

What are emerging technologies?



“A technology or solution, not in common use, that promises a quantifiable increase in efficiency of energy end-use as seen by utility customers.” - *BPA, 2008*

What are they doing in California? (PG&E 2005)

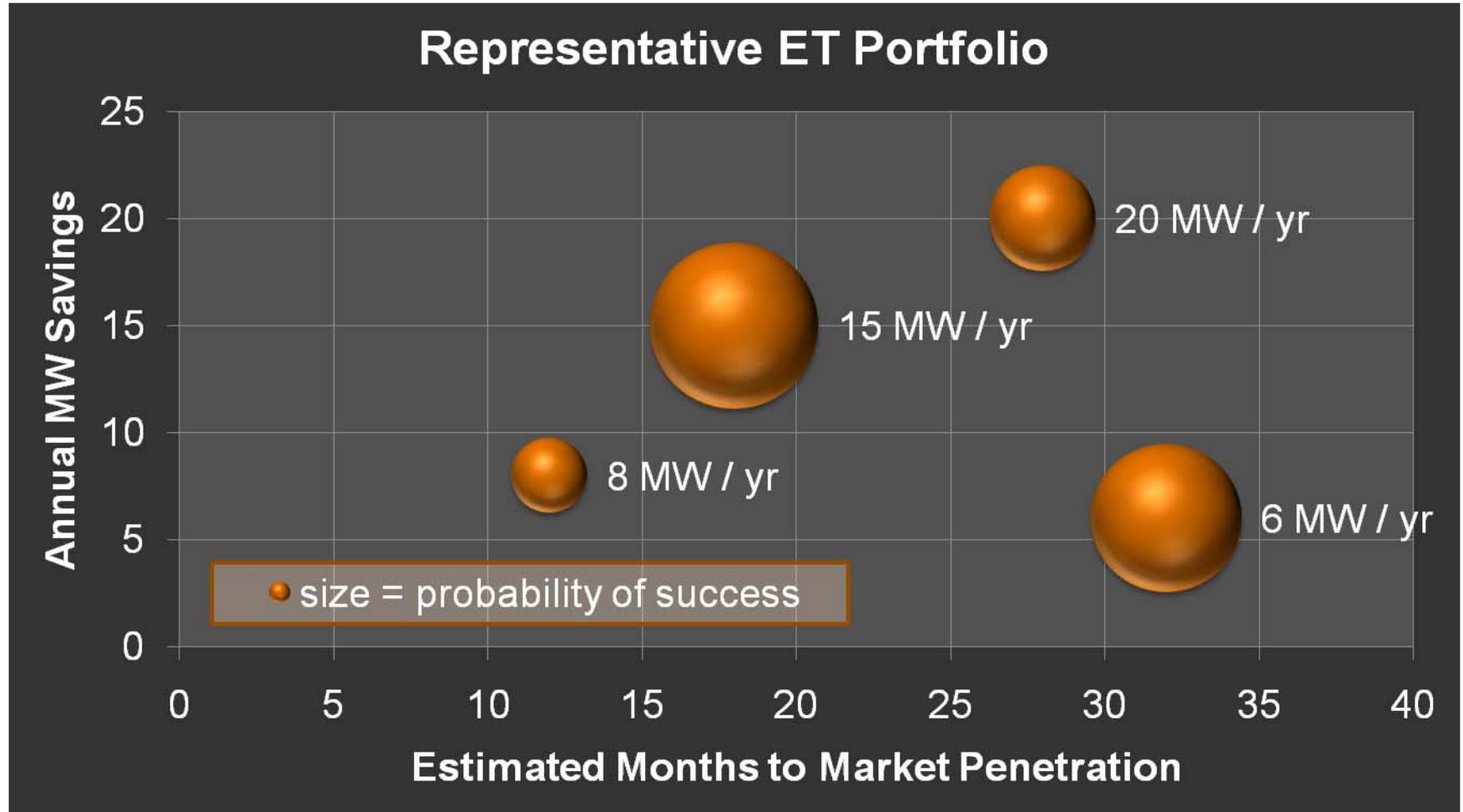


--- New technologies and applications may cycle between Product Engineering and Commercial Introduction several times until the correct mix of features, performance, price, availability, etc. are reached. Degree of failures and risk are high.

You'll find ET teams all over the world

- **BPA**
- **NEEA**
- **California utilities**
- **CEC PIER**
- **BC Hydro**
- **Ontario Power Authority**
- **E Source**
- **Focus on Energy / CleanTech Partners (Wisconsin)**
- **Pecan Street Project (Austin)**
- **NYSERDA**
- **NEEP**
- **Massachusetts Technology Collaborative**
- **Connecticut Clean Energy Fund**
- **ACEEE**
- **EPA Climate Choice**
- **Advanced Energy (NC)**
- **UK Carbon Trust**
- **Electricité de France**

Manage ET risk with a portfolio approach



Comprehensive Approach

Continuity: Ongoing TI activities (w/ typical **6 – 18 mo.** ET projects)

Technology
Scanning

Portfolio
Management

Energy
Efficiency
Linkage

Continuity: Energy Smart Innovations Center

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Gather market intelligence to find future opportunities

- **Read the technical literature and connect with...**
- **Entrepreneurs**
- **Consulting companies**
- **Universities**
- **Large technology providers**
- **Utilities – and their customers**
- **Private / venture investors**
- **Labs**

Screen technologies qualitatively

- **Who is advocating this technology?**
- **How significant is its potential energy savings?**
- **How large is its potential market?**
- **Will customers want it – or not?**
- **What could keep it from success in the market?**

Select projects quantitatively

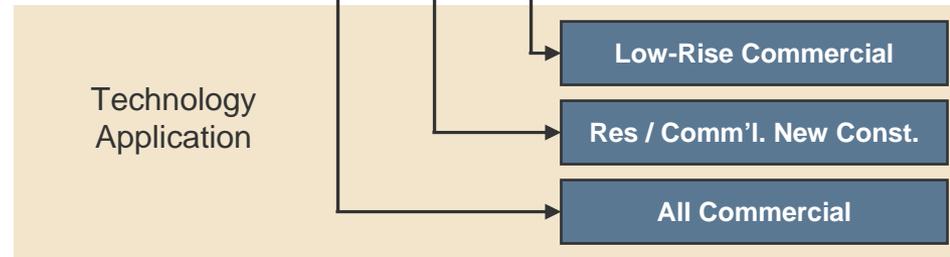
- **Why is this a compelling solution for the customer – value, comfort, safety, productivity, aesthetics, self-esteem?**
- **What are the projected savings?**
- **How large is the market?**
- **What is the projected 5-year market penetration?**
- **How strong is the financial case?**
- **What are the risks of failure – technical, product/manufacturing, business, market?**

Optimize assessment and validation

- **Start with robust experimental design**
- **Maintain credibility, objectivity, and confidentiality**
- **Measure vendor, customer and installer acceptance**
- **Address all major uncertainties**
- **Apply brutal honesty to the findings**
- **Provide constructive feedback to the product developer if assessment discloses flaws**
- **Provide sponsors with all the facts they need for market deployment without hesitation**

Create and follow a SMART ET roadmap (illustrative)

	2009				2010				2011				Potential Savings	Sponsor	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
HVAC															
Hybrid RTU														300 GWh (lifetime), 92 MW	Regional Agency
Mesh Wireless EMS														620 GWh (lifetime), 44 MW	Utility A
Quality Installation Package														97 GWh (lifetime), 17 MW	Utility B
Economizer Enthalpy Control														TBD	Manufacturer



Last but not least, track ET impacts

- **Document what happens next with completed assessments**
- **Get savings records for utility programs that support successes**
- **Investigate market and technical failures**
- **Stay current on technologies that failed in assessment**

Contact Information

Jonathan Livingston

Direct: 415.383.7480

Cell: 415.306.3582

e-mail: Jonathan@Livingston-ei.com

