

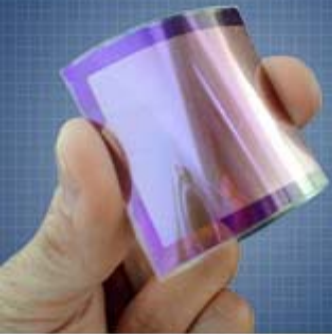
Film-Silicon PV:

The Next Generation in Solar Technology

CLEANTECH FORUM - Washington, D.C.
SEPTEMBER 2008



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Ampulse Company Background

- ❖ A collaborative effort between prominent clean-tech entities



- ❖ Ampulse President & CEO - Steve Hane

- experienced venture-environment executive
- most-recent position: CEO of Picolight, a \$125M M&A exit in 2007
- strong team of experienced talent being assembled

- ❖ Driving the Road Ahead

- considerable resource, momentum and interest driving the company
- "seen it before" commercialization experience
- 60-patent IP portfolio spanning substrate and deposition techniques

Ampulse Technology Proposition

- ❖ **Film-Si: thin-layer, oriented silicon on flexible, rugged substrate**
 - utilizes low-cost, flexible and rugged RABiTS substrate (ORNL)
 - utilizes material and process-efficient Si-deposition techniques (NREL)
- ❖ **Advantages to Film-Si PV**
 - low dependency on silicon; 25-100X less than traditional c-Si PV
 - simplified manufacturing processes
 - even with falling Si costs, still could be \$.50-1.00/W less at module level than other c-Si players, and under TF-PV players as well
 - high energy conversion efficiencies achievable (15%+)
- ❖ **The Endgame**
 - solar PV cell materials at <\$1/watt (hypothetical: <30 cents/watt)
 - “near-crystalline Si” performance (pathing upward of 15%)
 - application-flexibility in multiple deployment strategies
 - a real shot at being the high efficiency / low-cost player

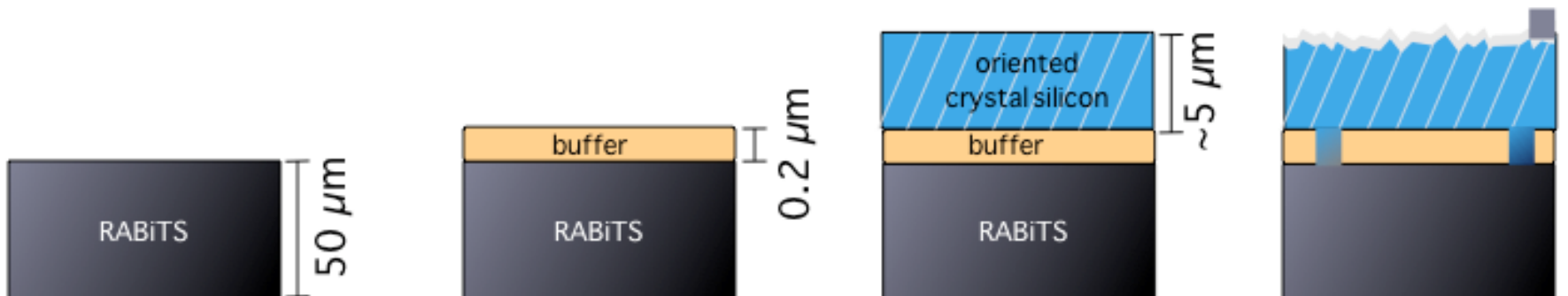
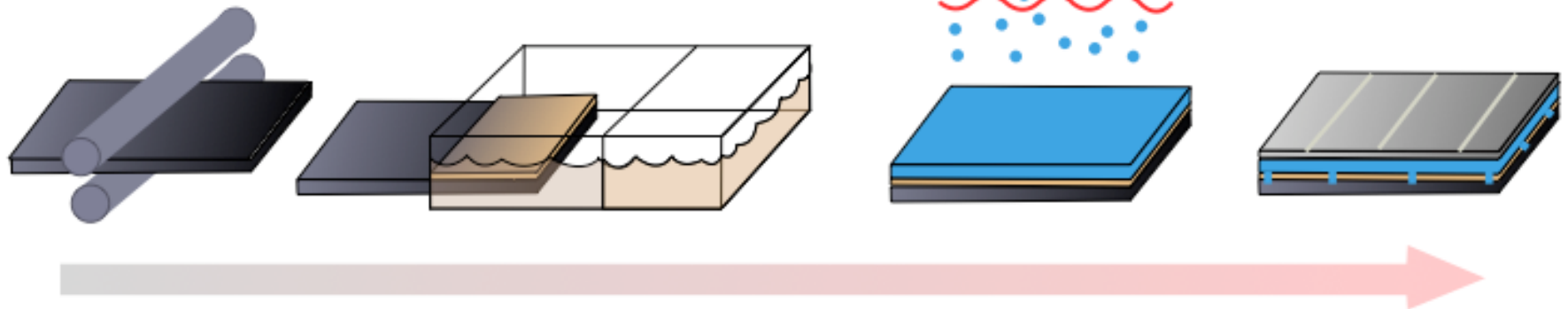
Ampulse Manufacturing Process Flow

Rolling & Heating

Solution-based buffer growth

HW-CVD Si deposition
(replacing numerous and costly Si-processing steps)

Device Fabrication
(common PV techniques)



Film-Si PV: Third Generation Advantages

	c-Si	A-Si	CIGS	CdTe	Film-Si
15% efficiency potential	✓	X lowest	✓	X	✓
abundant raw material / used efficiently	X	✓	X Indium	X Tellurium	✓
non-toxic material	✓	✓	X	X Cadmium	✓
simplified mfg. processes	X	✓ simplest	✓	✓	✓
mfg process tolerances	✓	✓	X	✓	✓
low energy payback	X	✓	✓	✓	✓
<i>Lowest total cost solution / best balance of efficiency, costs, materials</i>					✓

Ampulse Business Model & Strategy

- ❖ **Drive rapid commercialization of next-gen Film-Si PV cell**
 - material characterization, form-factor, and production spec work done in a parallel National Labs R&D effort prior to outside investment
 - focus on inserting in the market at the cell level
- ❖ **Capital-efficiency via a contract-manufacture production model**
 - many “Si-capable” fab/mfg players are sitting on stranded capacity in declining semi-conductor and memory businesses
 - many of them are looking for a transition into solar PV
 - catch them in transition; partner to minimize up-front capital requirements
- ❖ **Provide a needed “next-gen uplift” to transitioning PV players**
 - refresh product roadmaps of existing players with next-gen Film-Si cell
 - aid new entrants with “the right technology launch”
 - time and expense efficiency in path-to-market/channel establishment

Ancillary benefit: this model will develop strategic options

Capital Planning / Company Development Path

(Quarter Ending)

Sep. 08	Dec. 08	Mar. 09	Jun. 09	Sep. 09	Dec. 09	Mar. 10	Jun. 10	Sep. 10	Dec. 10	Mar. 11	Jun. 11	Sep. 11
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**Seed
Capital**

- ❖ parallel developments
- ❖ engage partners

Series A

**Start
Raise** | **Term
Sheet** | **Close**

- ❖ develop piloting capability
- ❖ first revenue tractions

❖ \$10M Series A

Series B

**Start
Raise** | **Term
Sheet** | **Close**

- ❖ scale mfg partners & channel
- ❖ commercial revenue scale

❖ \$50M Series B

- By end of 2009: business model functioning with supply, manufacturing capacity, and PV system/channel partners

Thank You

Steve Hane

President & CEO - Ampulse

steve@ampulse.com (m)303-919-9484



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