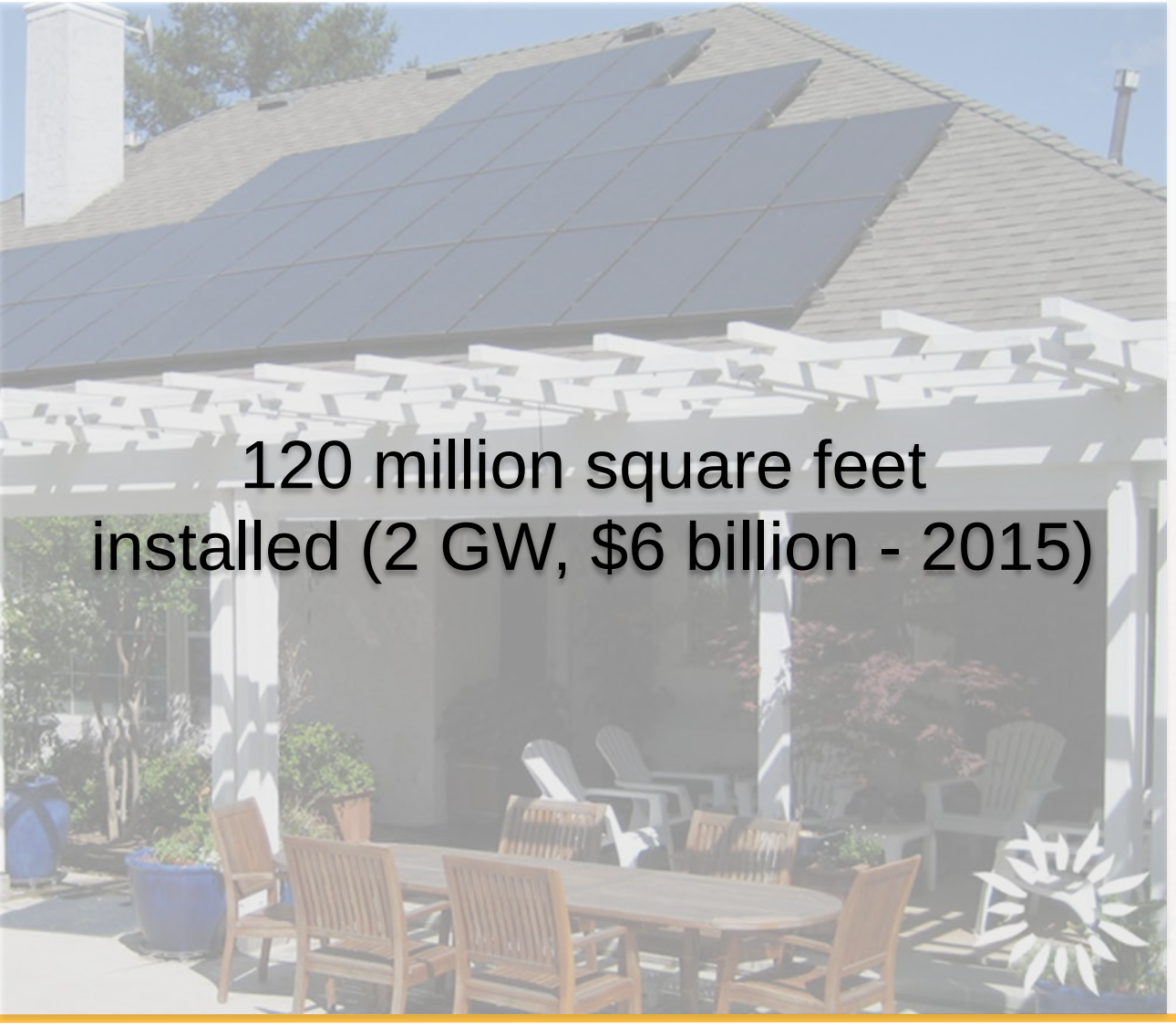
Building-integrated solar power – hybrid hope or hybrid hype?

Eric Schiff, program director

Rome Trade Fair, Italy (2009)

Building-applied & building-integrated rooftop photovoltaics

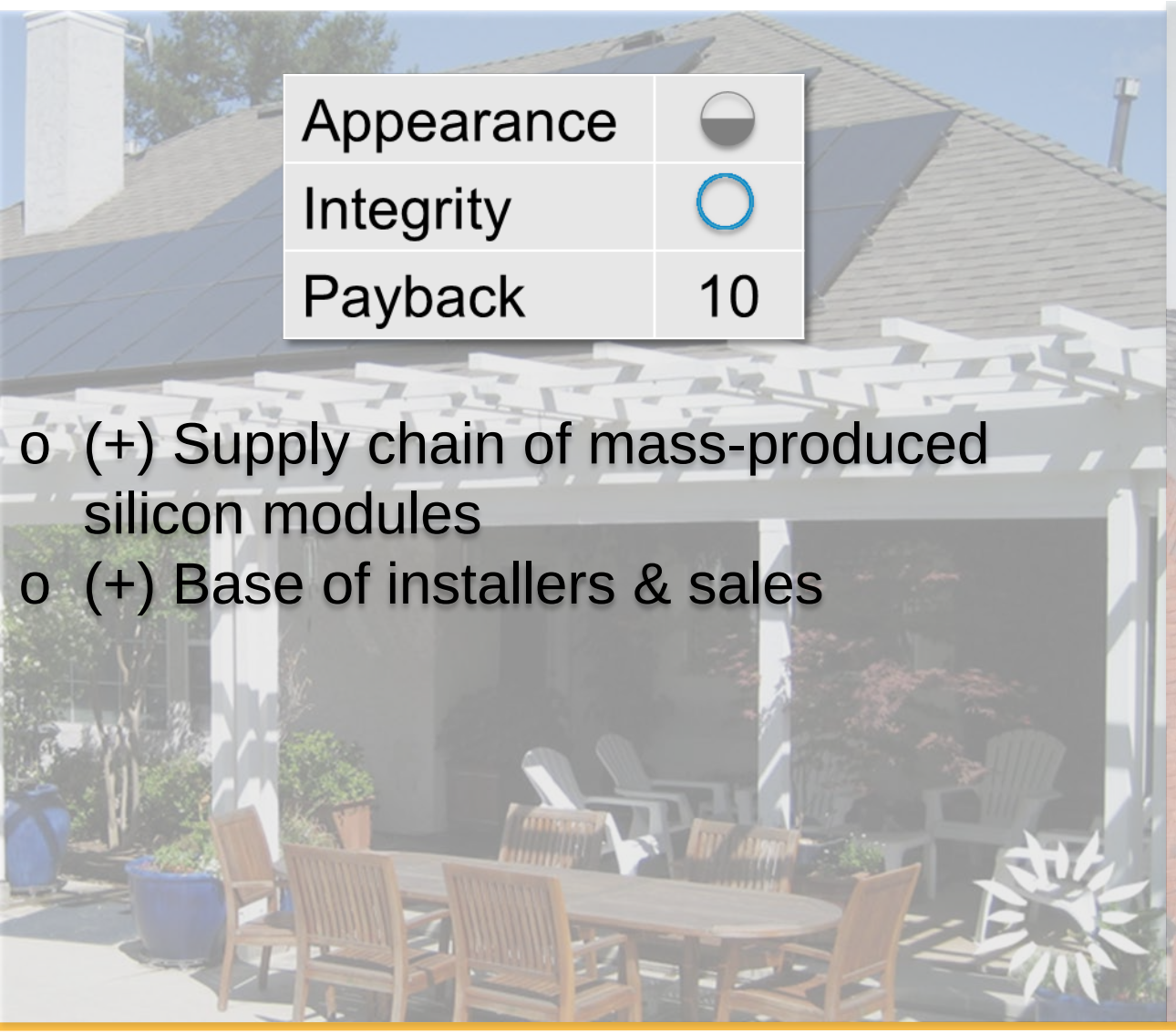
Building-applied rooftop photovoltaics & conventional roofing



120 million square feet
installed (2 GW, $6 billion - 2015)

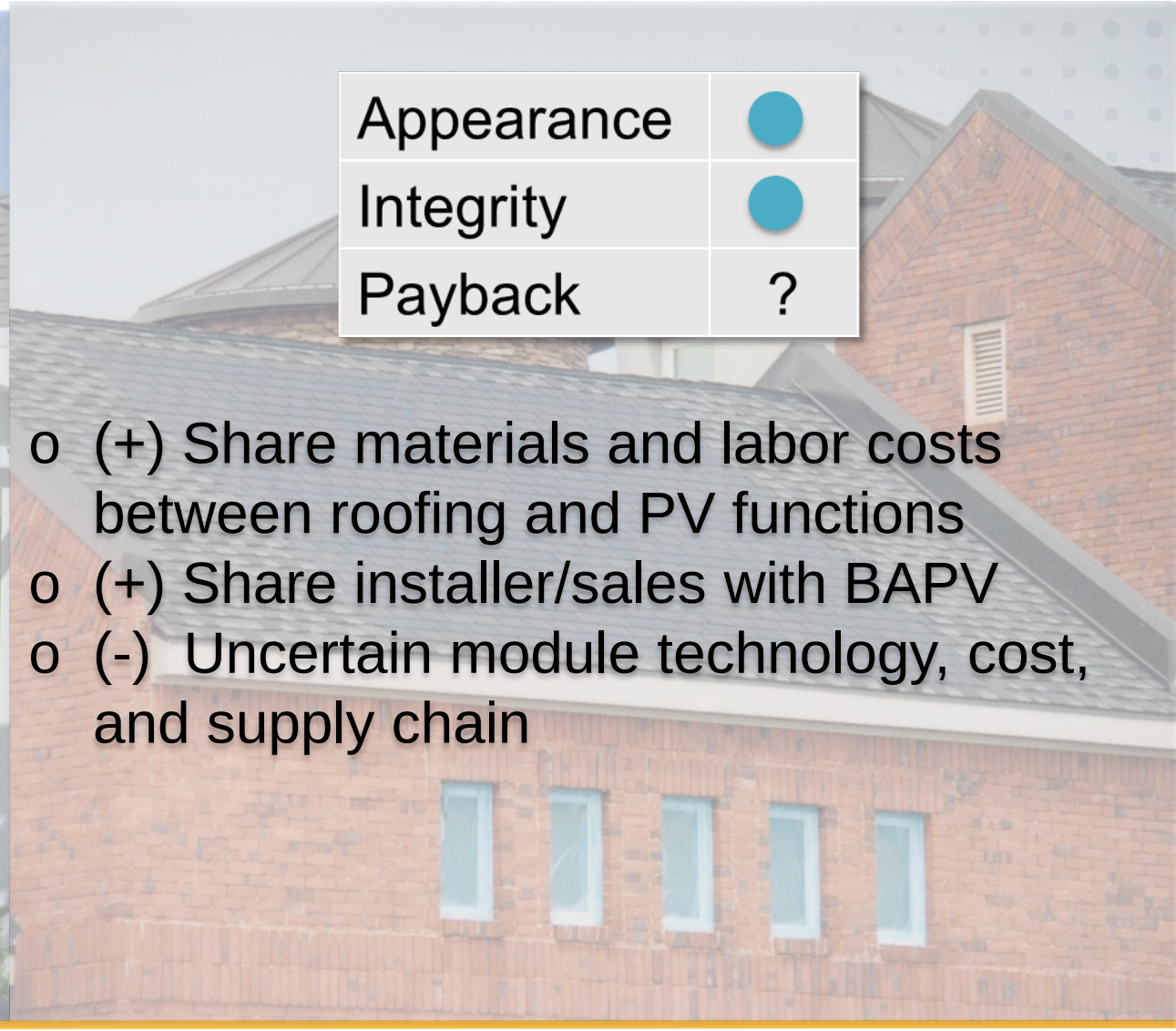
13 billion square feet
installed without solar (2016)

Building-applied & building-integrated rooftop photovoltaics



Appearance	◓
Integrity	○
Payback	10

- (+) Supply chain of mass-produced silicon modules
- (+) Base of installers & sales



Appearance	●
Integrity	●
Payback	?

- (+) Share materials and labor costs between roofing and PV functions
- (+) Share installer/sales with BAPV
- (-) Uncertain module technology, cost, and supply chain

Solar premium analysis for BIPV

Appearance	●
Integrity	●
Payback	<10

Roofing technology	Price (/sf) (no solar)	Price (/sf) (solar)
BAPV	-	$ 45
BIPV price premium	-	< $ 40
Asphalt shingle	$ 5	$ 45
Standing seam metal	$10	$ 50
Slate	$20	$ 60

- No ITC.
- 14% BIPV efficiency (allowing for: misalignments, AC-DC conversion, appearance)
- 16% BAPV efficiency (no appearance premium)
- Solar module has the same area as roofing product
- $0.18/kWh (retail residential price of electricity “CA”)

New hope for BIPV?

(+) price “lift” from roofing

(–) higher roof temperatures

(+) c-Si, CdTe, CIGS at scale

(+) perovskite possibilities

(+) large US installer/sales base

(**?**) optics for appearance/choice & performance

(**?**) low-cost integration of PV & roofing

ARPA-E & BIPV

- Is there a portfolio of new, high risk technologies that will catalyze BIPV's market penetration into roofing (or beyond)?
  - Appearance, integrity, and solar payback
  - IDEAS – exploratory projects for new program areas
  - OPEN 2018 – anticipated for 2018

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