

**SUNTEGRA**<sup>®</sup>

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February 6, 2020

Better Buildings By Design 2020

*Efficiency Vermont*

## *Solar Roofing – A Better Way to Go Solar*



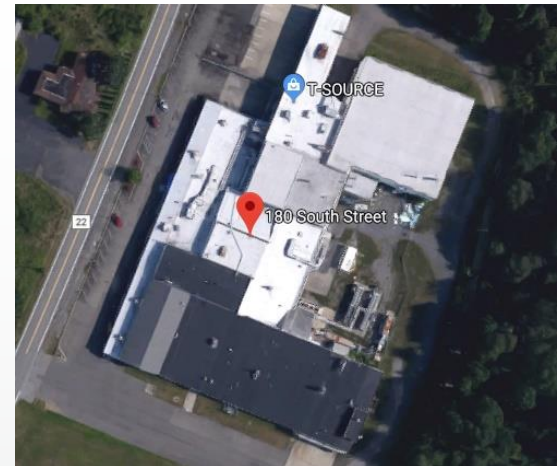
- Introduction to SunTegra and Solar
- Why Solar Roofing
- SunTegra Product Overview
- Solar Roofing Product Overview
- Solar Roofing Economics
- Q & A



# Company Snapshot

SUNTEGRA™

- SunTegra founded in Dec 2012
- Shipping products since 2014
- Experienced team
  - 15+ years solar / solar roofing experience
- Offices
  - Main Office: Binghamton, NY
  - Ops / R&D: Highland, NY
- Established Dealer / Partner network
  - US and Canada
- Established supply chain





## SUNTEGRA™ TILE

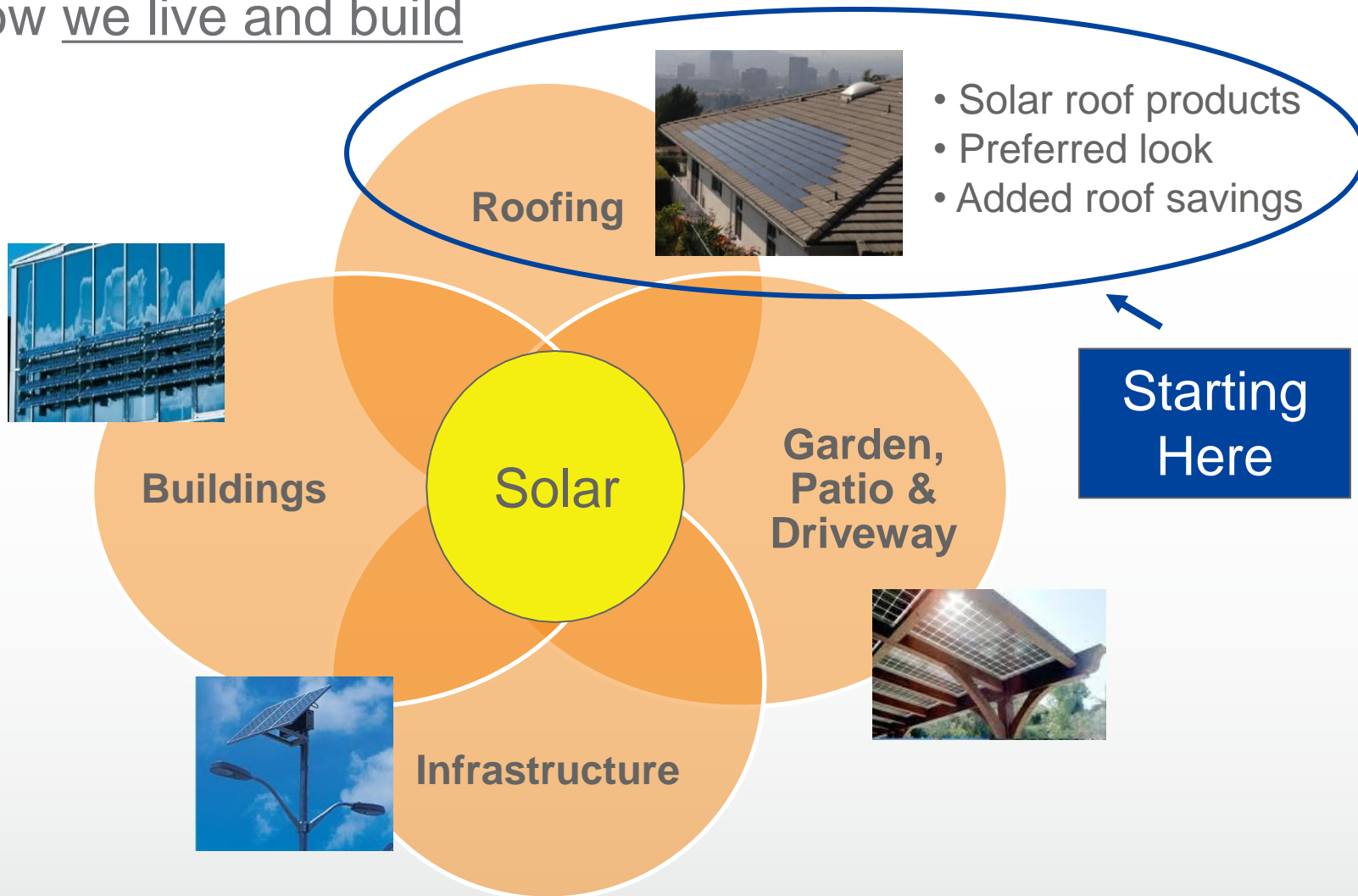


## SUNTEGRA™ SHINGLE



See Product Datasheets at:  
<http://www.suntegrasolar.com>

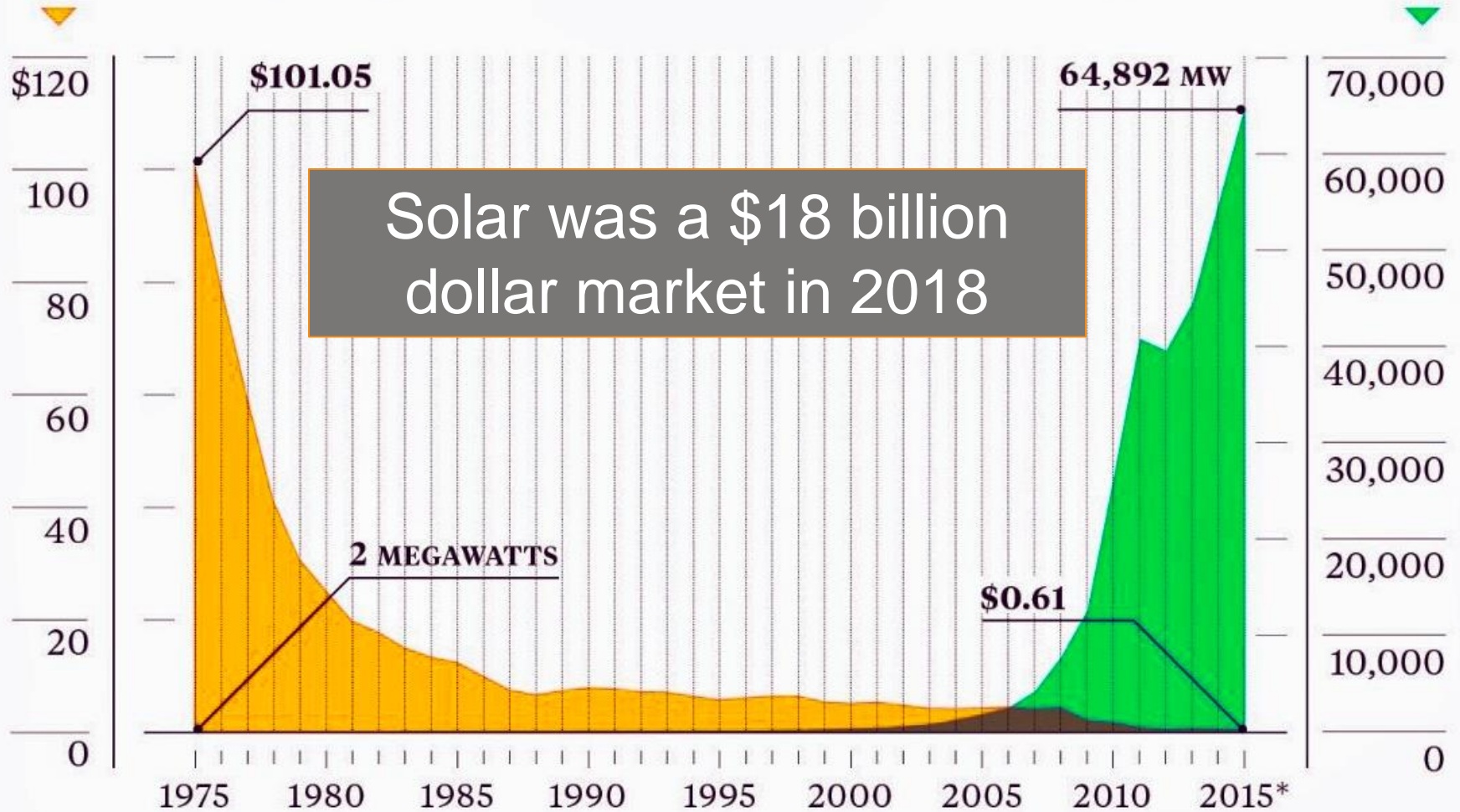
Provide innovative solar solutions that integrate with how we live and build



# Solar Has Come A Long Way

Price of a solar panel per watt

Global solar panel installations



\*Estimate. Sources: Bloomberg, Earth Policy Institute, [www.earth-policy.org](http://www.earth-policy.org)



- US Residential solar market size
  - \$4 Billion today; 10 Billion+ by 2022
- Residential Roofing
  - 5 million new roof / reroofs per yr
- Sustainable Economics
  - Federal tax credit in place until 2021
  - Beyond 2021, cost-effective without incentives
- Additional Drivers
  - Solar + Storage offers added value to homeowner and utility
  - State and city solar building mandates
    - 2020 CA solar requirement for all new homes



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# Market Problem

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3 out of 4 homeowners don't like the look of conventional solar...

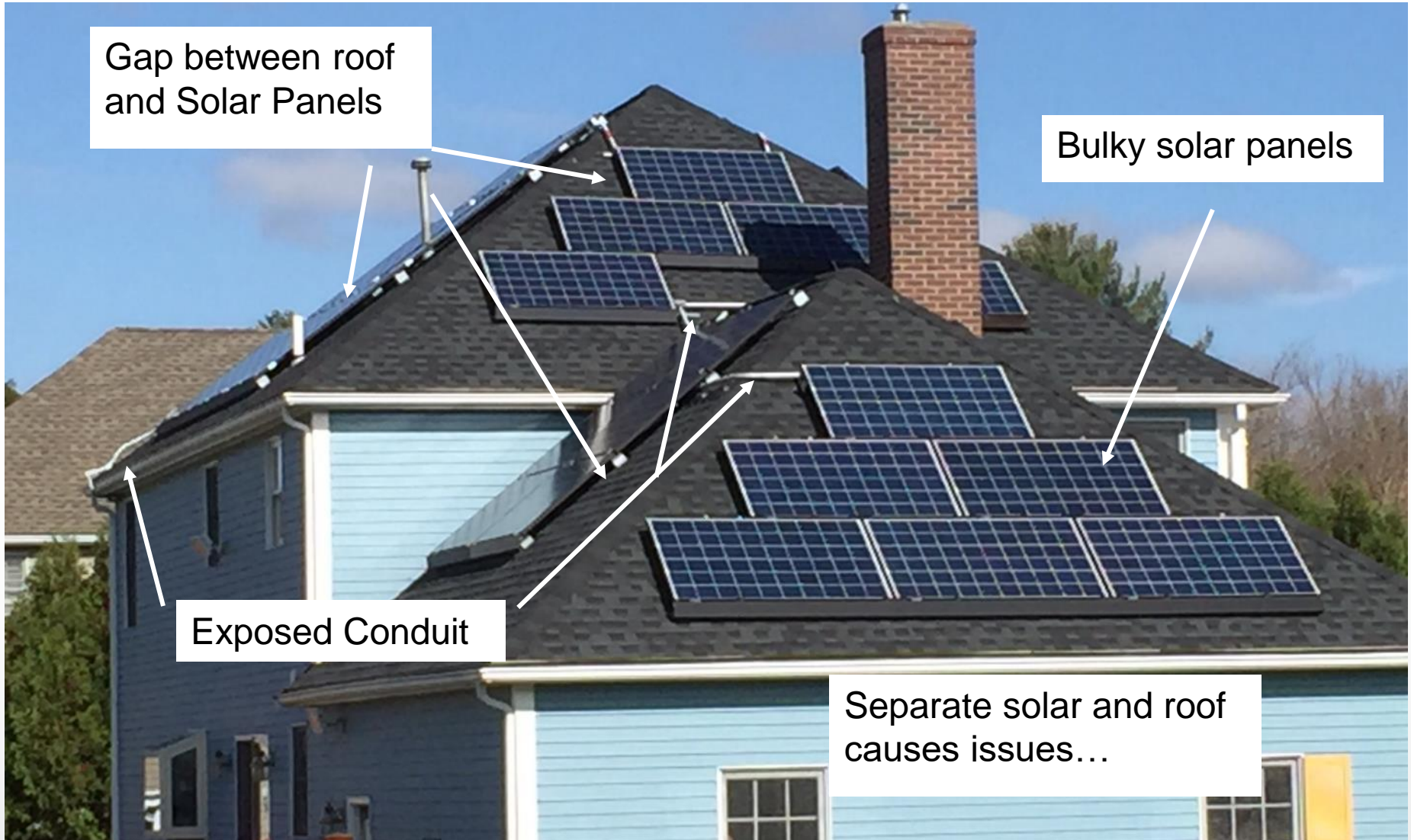


...and traditional panels on roofs are less than optimal technically

\* Based on survey data of homeowners interested in solar performed by professional market research firm.

# Conventional Solar Reality

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# What do Homeowners Want?

SUNTEGRA™

Homeowners want solar that integrates and blends

SUNTEGRA™ SHINGLE



Low Profile

Roof-like  
Appearance

No Exposed  
Conduit



# SunTegra Shingle vs. Conventional



SUNTEGRA™ SHINGLE

Traditional “Rack-Mounted” Solar





# What do Homeowners Want?

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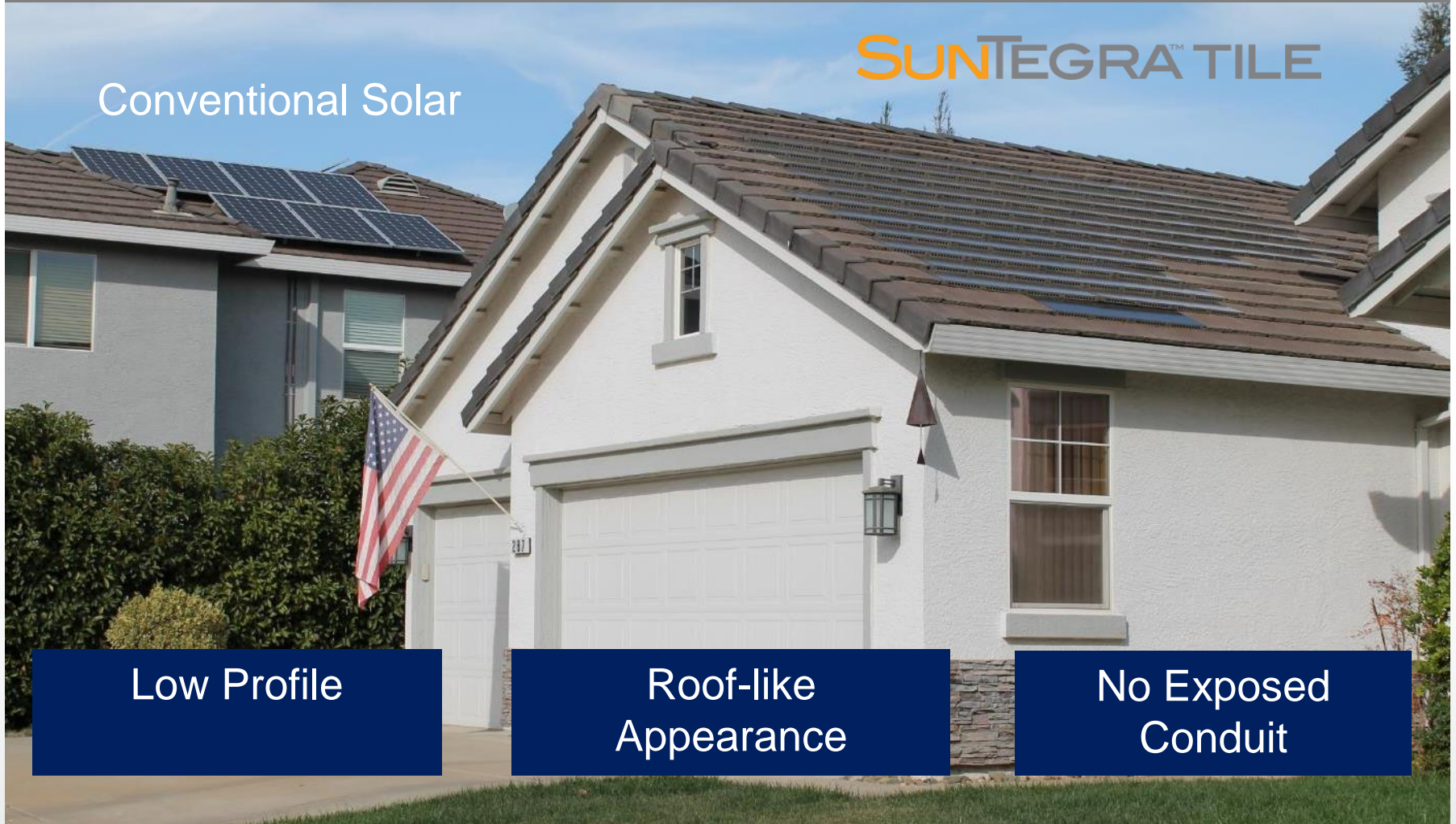
Conventional Solar

SUNTEGRA™ TILE

Low Profile

Roof-like  
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- Homeowner Benefits

Benefit	Solar Roof	Conventional Solar
Preferred roof-like appearance	✓	
Roof savings*	✓	
Added Safety/Durability - wires protected from weather and vermin	✓	
Good ROI	✓ At Scale	✓
Performance and Reliability	✓	✓

*\*Replaces roofing materials; enables future reroof around system*



**SunTegra  
Solar Roof**



**Conventional  
Rack-mounted  
Solar**

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## SUNTEGRA™ SHINGLE

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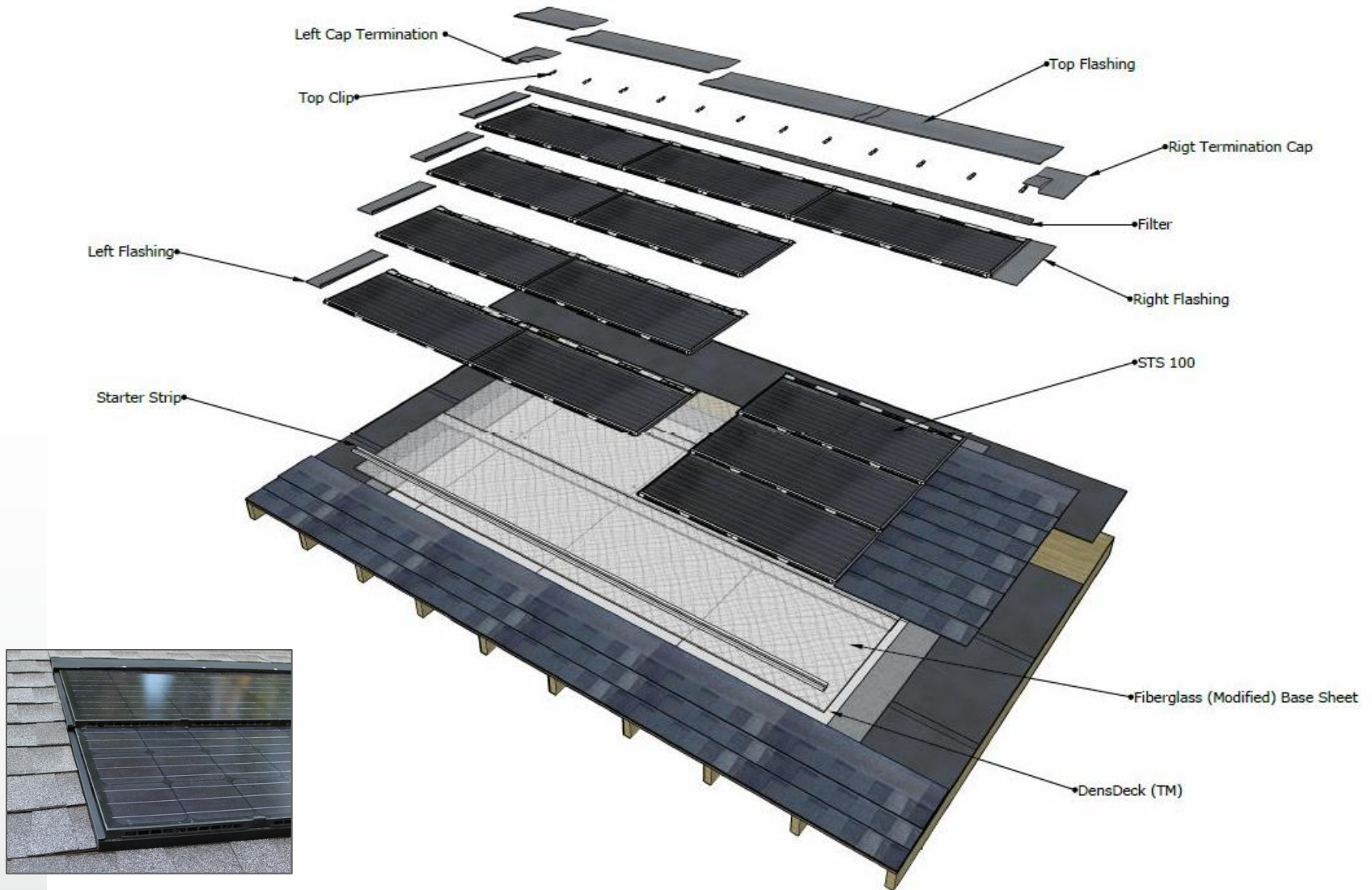
- Power Rating: 110 W DC
- Panel Efficiency: 16.6%
- Watts / Square: 15.3 Watts
- Power Tolerance: +5/-3%
- Exposed Area: 52 1/16" x 19 3.4"
- Weight: 18 lbs. (2.5 lbs./ft<sup>2</sup>)

*For more technical information, please download product datasheet at: [www.suntegrasolar.com](http://www.suntegrasolar.com)*

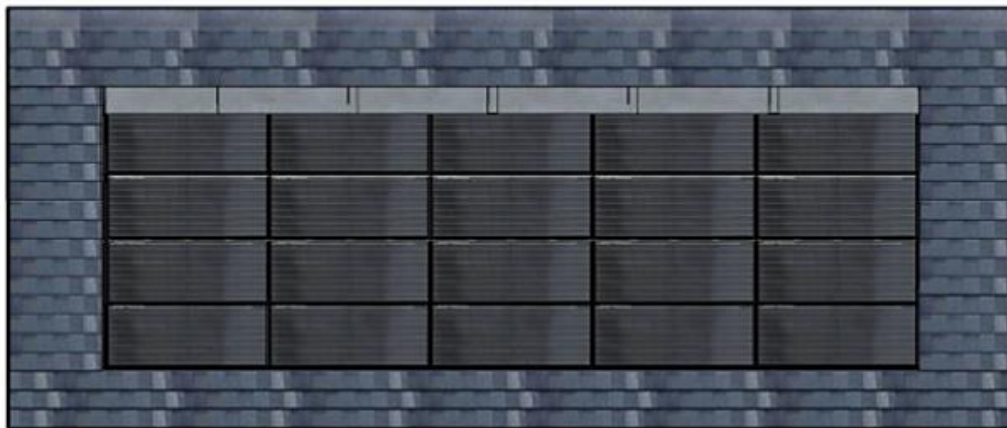




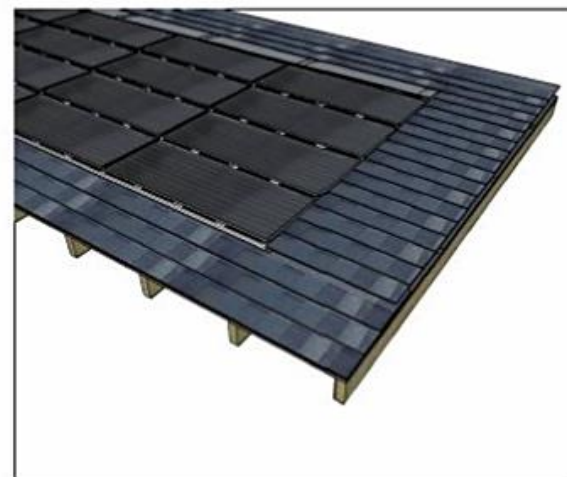
# SunTegra Shingle System Overview **SUNTEGRA™**



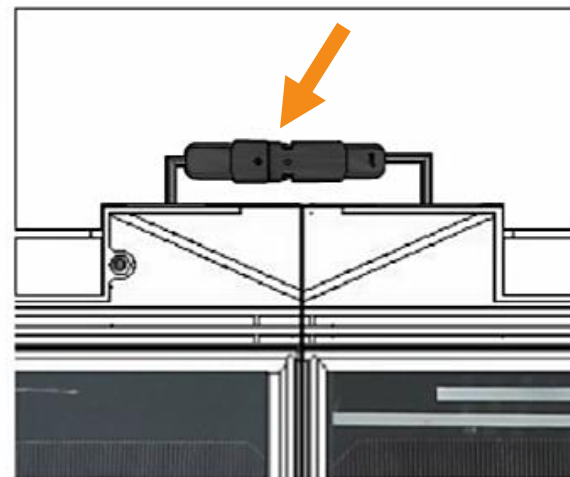
# SunTegra™ Shingle Wiring Overview



Row-to-Row Jumper Cables install comfortably underneath the upper succeeding row of modules and remain protected from weatherization and wildlife as per the diagram below.



Integrated Wiring and Dual Junction Boxes on each panel make horizontal panel-to-panel install quick and easy.



- Certified Both as PV and as a Roofing Material

Suntegra™	Rack-mounted Solar
<b>PV Standard:</b> UL/ULC 1703  <b>Roofing Standards*:</b> UL790 (Fire) UL 1897 (Wind) TAS 100-95 (Rain)	<b>PV Standard:</b> UL 1703 (Solar Panel), UL 2703 (Rack Mounting)



- High Snow-load and Wind Resistance
  - **Snow load: 112 lbs / ft<sup>2</sup>** load rating (5400 Pa)
  - **Wind load: 110 to 130 mph standard.** Higher with alternative attachment methods.



- Solar Shingle Warranty
  - 10 year limited product warranty
    - Includes roofing guarantee for solar zone
  - 25 year limited solar power warranty
- Technical Support
  - SunTegra technical support staff provide training and remote technical support





























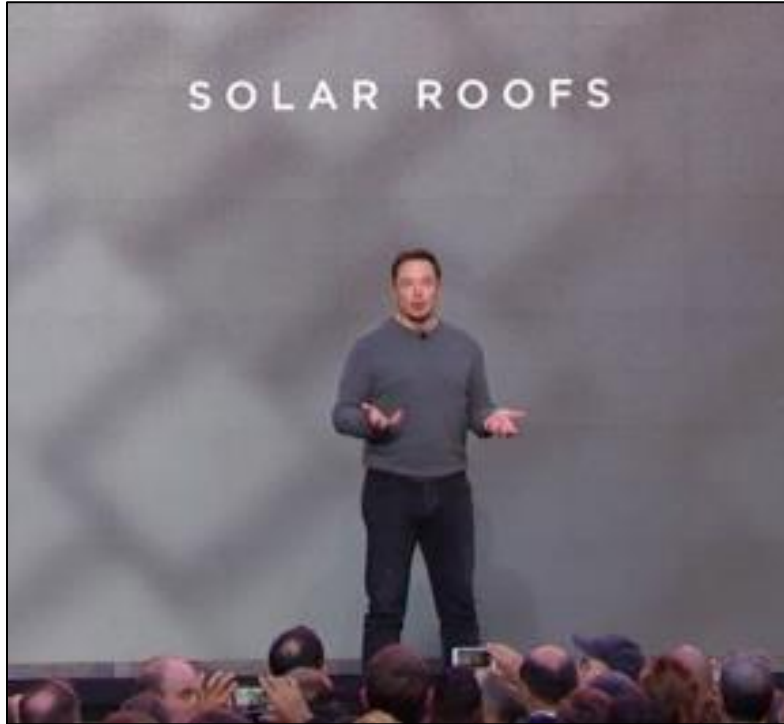






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- SolarCity / Tesla has announced it will release a solar roof product end of 2017
- They started taking orders in 2018
- They have reportedly delivered on 12 systems... but reality will catch up to the hype someday

TEXTURED



SMOOTH



# Tesla's Solar Roof Vision

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# Solar Roofing Competitors

*Product Comparison on Scale of 1 to 5, 5 is best*

Competitor	Product	Aesthetics	Cost	Performance	Ease of Installation	Space for Optimizer	Mainly sell solar panels
	SunTegra Shingle SunTegra Tile	4	4	4	3	Yes	No
	Apollo II Shingle Apollo II Tile	4	4	3	3	No	Yes
	DecoTech (Shingle)	3	5	3	2	Yes	Yes
 	Smooth Glass Textured Glass	5	2	3	2	No	Yes
	Dow Product w Crystalline Cells (Solar Shingle)*	4	3	3	3	No	Yes

\* Available starting 2019

# Residential Solar Landscape

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Conventional Solar



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TESLA



99% of Market Today

Positioned for mass market

- Much better aesthetics
- Works with common roofing materials
- Leverages existing roofing channel
- 10% premium vs. conventional PV
- Lower total solar + roof cost

High end market

- Replaces all roofing materials
- Requires specialized installers
- Very High cost

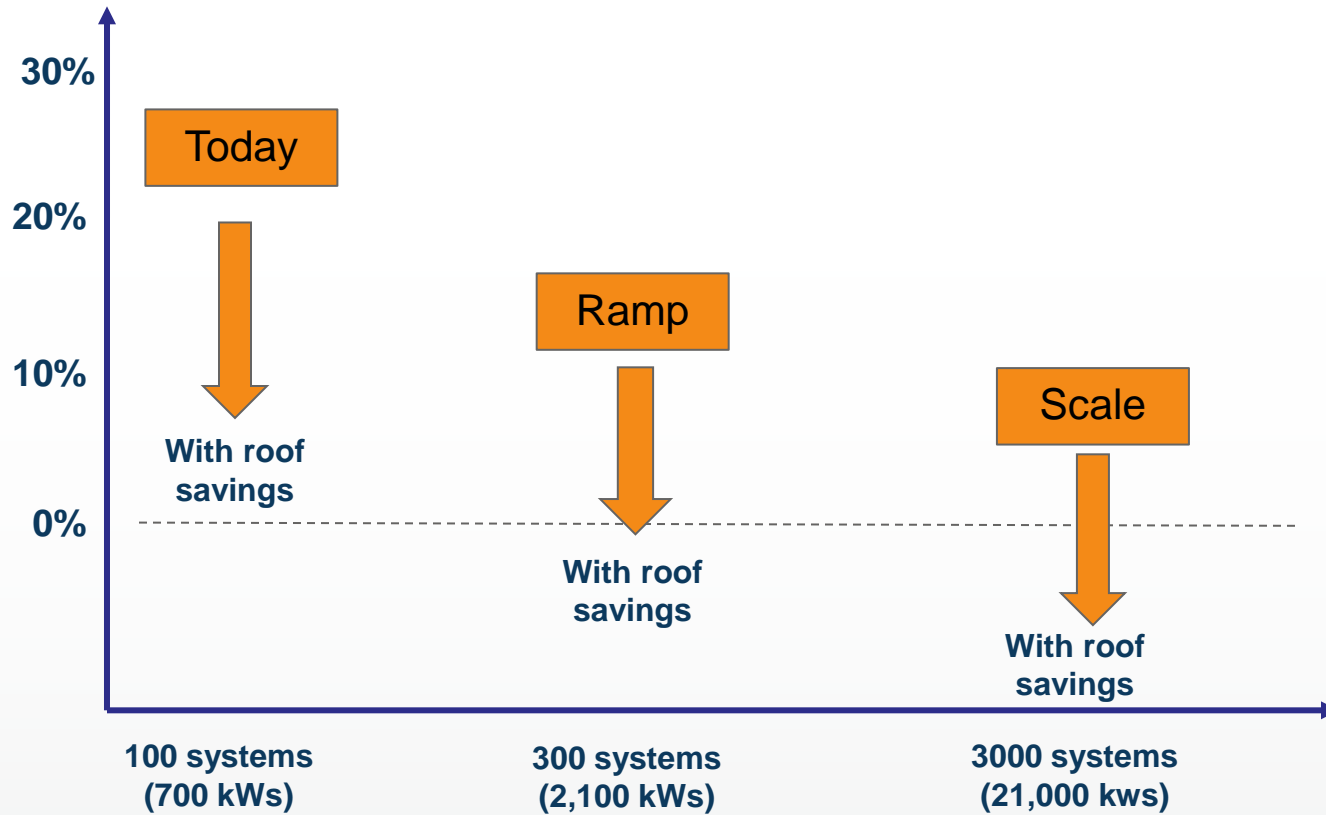
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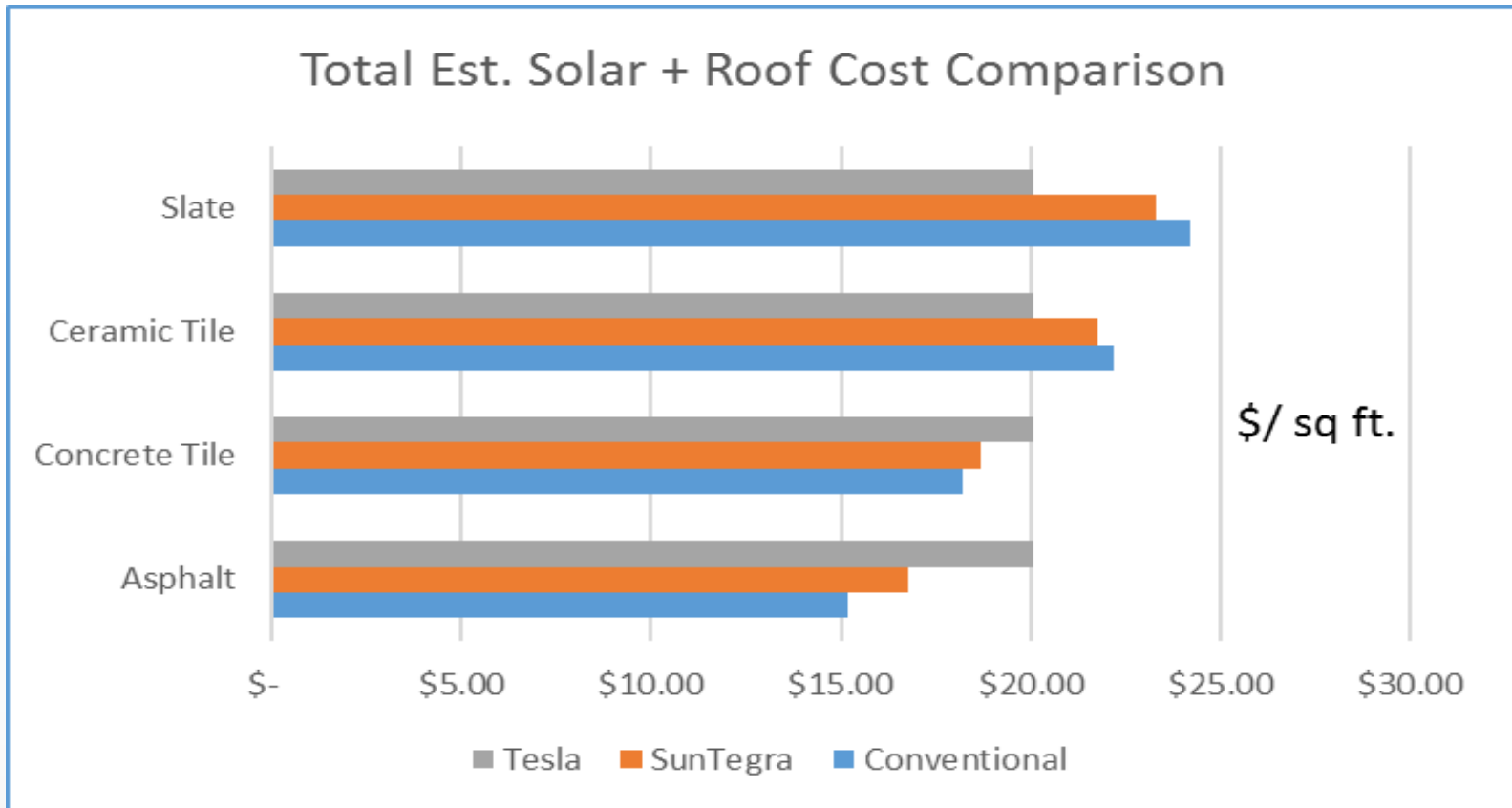


# Cost competitiveness vs. Conventional Solar

## Price premium versus traditional residential solar\*



- Solar Roofs Will Penetrate the Market, But it Will Take Time



\* Note based on a comparison of market pricing today and Tesla's published pricing. True Tesla pricing will depend on when they will start shipping and in what volume

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SUNTEGRA<sup>®</sup>

Thank You



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- **Power Rating:** 110 W DC
- **Panel Efficiency:** 16.6%
- **Watts / Square:** 14.6 Watts
- **Exposed Area:** 52 1/16" x 19 3/4"
- **Weight:** 18 lbs. (2.5 lbs./ft<sup>2</sup>)



## SUNTEGRA™ TILE

- **Power Rating:** 70 W DC
- **Panel Efficiency:** 15.1%
- **Watts / Square:** 14.1 Watts
- **Exposed Area:** 52" x 13 3/4"
- **Weight:** 15 lbs. (3.0 lbs./ft<sup>2</sup>)



*For more technical information, please download product datasheet at: [www.suntegrasolar.com](http://www.suntegrasolar.com)*

- Overview of Available Products

## Conventional Solar



290 W ea  
172 W/m<sup>2</sup>  
16.0 W/ sq. ft.

## Solar Shingle



110 W ea  
165 W/m<sup>2</sup>  
15.3 W/ sq. ft.

## Tesla Solar Roof



10 W ea\*  
129 W/m<sup>2</sup>  
12.0 W/ sq. ft.