

PEDCO High-Performance Buildings Seminar

October 6, 2016

Role of Solar PV in Net Zero Buildings



OVERVIEW

- 1. Selling & Financing**
- 2. Design & Installation**
- 3. Operations & Maintenance**
- 4. Case Studies**
- 5. Solar Industry Outlook**



NET-ZERO ENERGY HEADQUARTERS

SELLING & FINANCING (DEVELOPMENT)

Typical price is \$2-3/Watt for small commercial systems. So 100KW will cost \$20K-\$30K.

A 100KW system will produce 150,000KWH/YR, and thus cost \$0.15-0.20/KWH vs average \$0.10/KWH

This includes 30% FITC and accelerated depreciation, but not demand and T&D savings

Sell based on demand savings, sustainability & carbon neutrality goals, hedging strategy, independence

SELLING & FINANCING (DEVELOPMENT)

- **Larger systems over 1MW (1,000KW) can be priced less than \$2/Watt with economies of scale**
- **More likely to involve a 3rd party investor who sells the power via a Power Purchase Agreement (PPA)**
- **PPAs and site lease typically 15+ years – typically behind meter. SRECS and FITs may be available too**
- **Often small initial premium but long term savings can justify the investment without additional benefits**

SELLING & FINANCING (DEVELOPMENT)

- **The customer/off-taker needs to be realistic. Often initial premium with long term energy savings. View as hedge against unpredictable rate increases.**
- **The investor also needs to be realistic. Solar is more akin to a bond fund returning 4-8% based on low risk, not equity fund returning 10-20% on high risk.**
- **The customer should ideally have other motivations, ie. wants to walk the talk on sustainability and reduce future costs/risks of carbon emissions.**

DESIGN & CONSTRUCTION (EPC)

- Siting: Roofs, Unused Land, & Parking Lots**
- Space: 1 Module = 300W, 250KW per acre**
- Net-Metering: Size to load profile, ie, <30% of usage**
- Interconnection: Ideally behind meter & close-by**
- Cost of impact study, IA agreement, permit, etc.**

OPERATIONS & MAINTENANCE (O&M)

- **Reliable - No moving parts unless a 1-axis tracker**
- **Warranties – panels 25 yrs, inverters 15 yrs, racking 20 yrs**
- **Other Risks - O&M contracts and insurance policies**
- **Solar Production – Modeled on 30-year averages**
- **Result – Predictable income stream for 25-35 years**
- **Maintenance – Grass cutting, inspections, cleanings**













SOLAR INDUSTRY OUTLOOK

Costs have decreased >80% in last 10 years

30% FITC extended 5 more years

Distributed generation allows control of energy future

Get ahead of the curve on likely carbon regulation

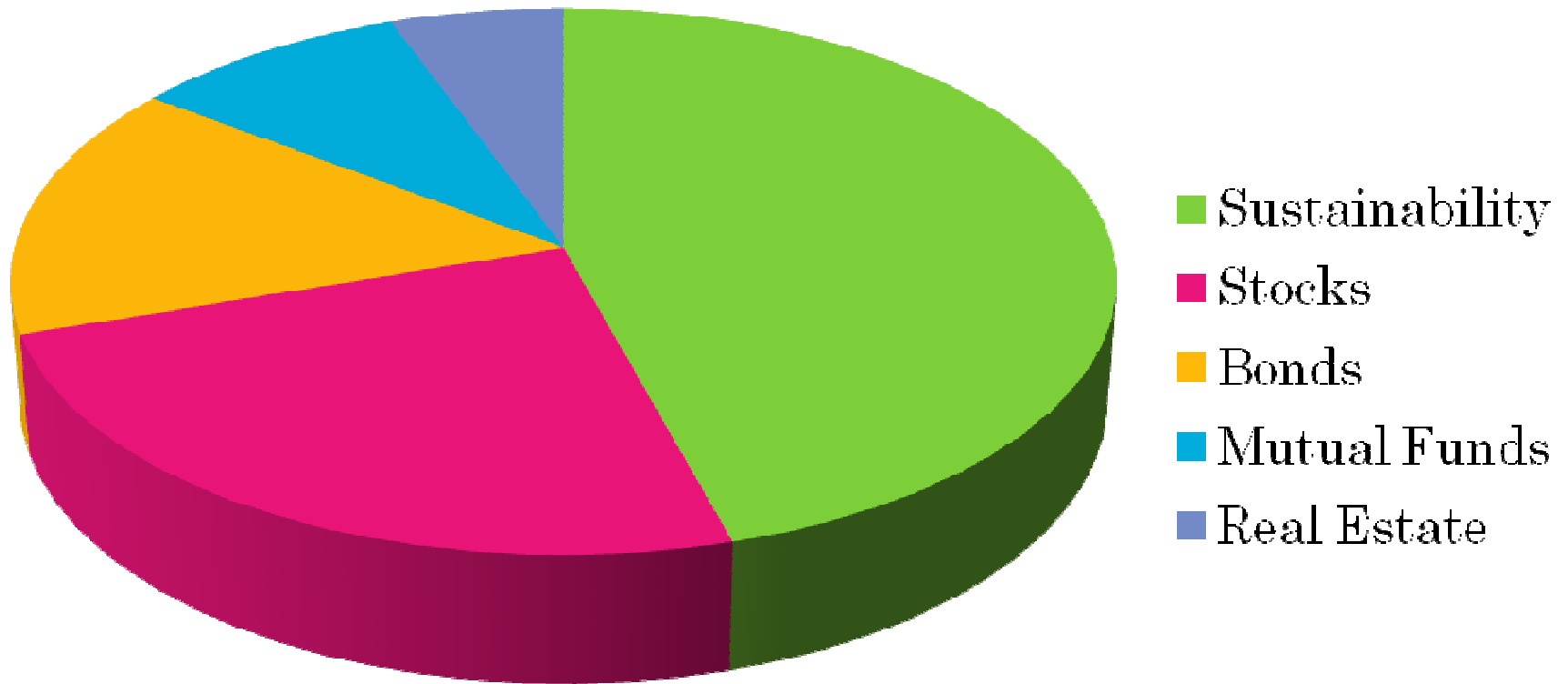
Market will grow exponentially for many years!

Historical Solar Builds in Ohio

- ▶ Solar power in Ohio has rapidly grown to 106 MW of installed capacity.¹
- ▶ Nearly 100% of Ohio' solar capacity has been built following the passage of the state's RPS.
- ▶ Ohio's RPS has been effective at stimulating development of solar resources. However, the current RPS freeze is impacting development.



DIVERSIFICATION STRATEGY



EMBRACE CLEAN ENERGY AGE

A company's total cost of energy is much more than the monthly utility bill, often > 20% of sales. You are in energy business whether you know it or not!

Whether you hedge against electric rates going up or not over the long term, you are hedging! All commodities go through boom and bust cycles!

Failing to diversify against long term costs and risks of carbon intensive business is failing to uphold your fiduciary responsibilities!

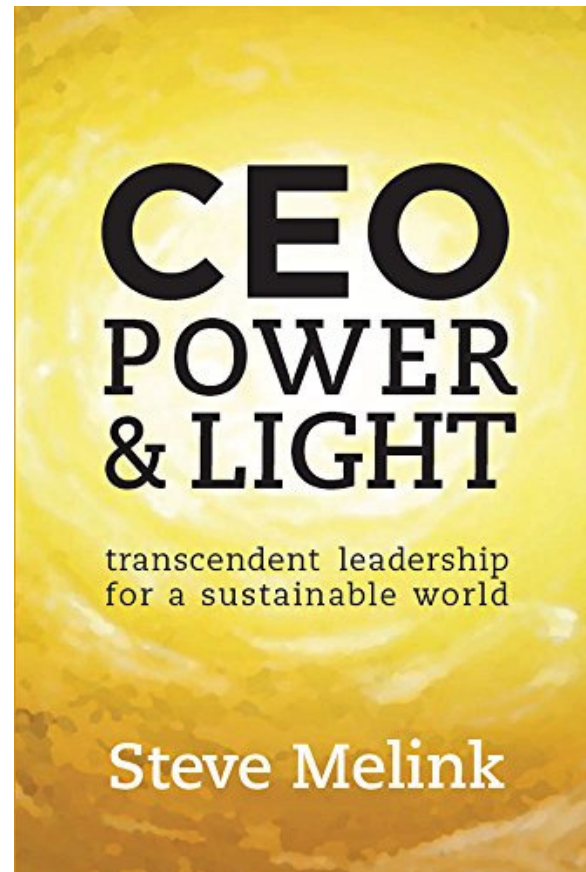
SOLAR PV IS GOING MAINSTREAM



BERKSHIRE HATHAWAY



A STRATEGIC ADVANTAGE FOR EVERY BUSINESS



THANK YOU

