



**midwest renewable energy association**

## **The Solar Endowment**

PV Investment Potential for Universities and Foundations

Presentation by Nick Hylla  
3/10/15 at MN CERTS Conference

# MREA Overview

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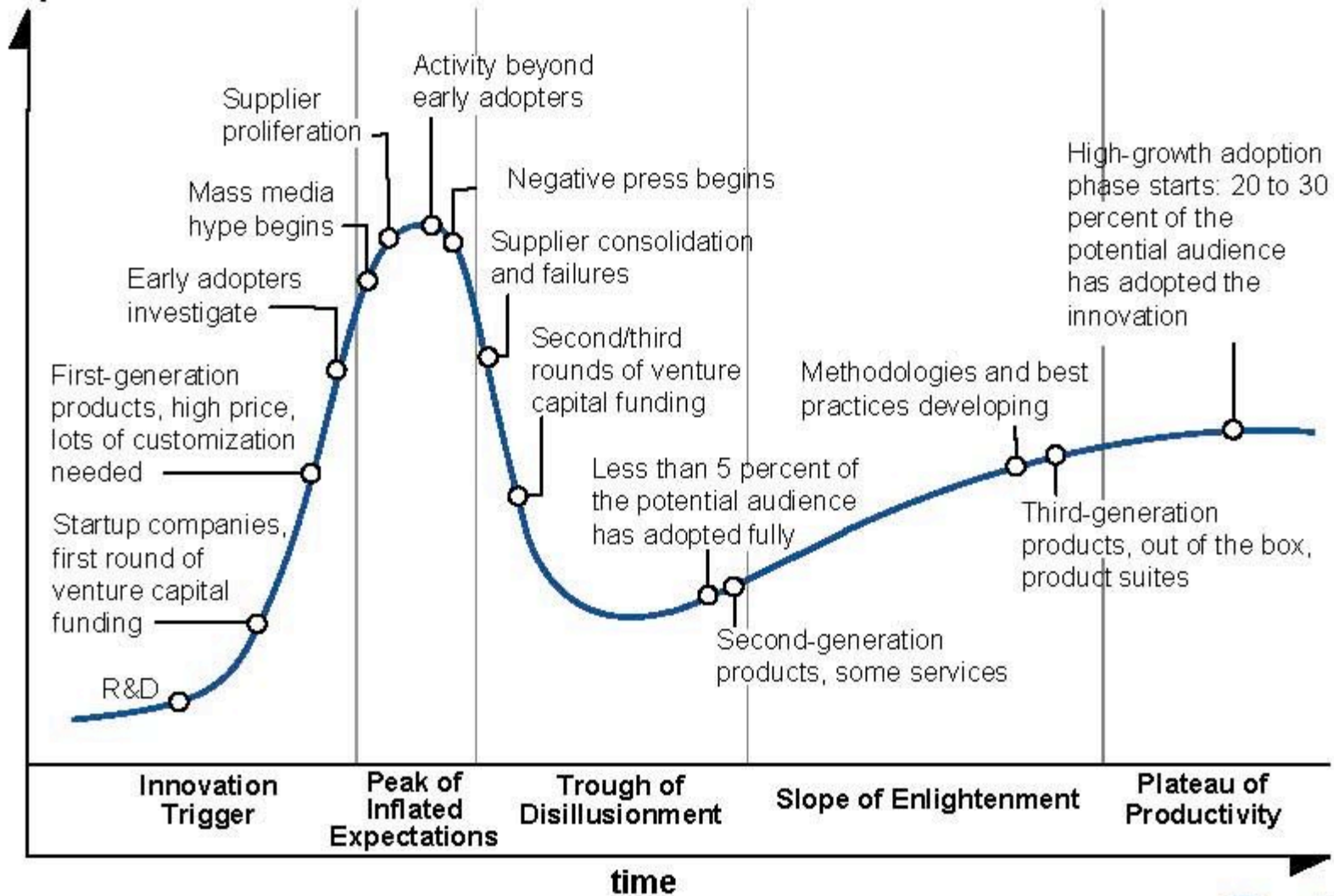


- RE Education and Demonstration
- 1800 Midwest members
- 26<sup>th</sup> Annual Energy Fair (June 19-21)
- Net Zero Campus (almost)
- Midwest Grow Solar Partnership
- The Solar Endowment
- Accredited Certificate Training
- C4 Program



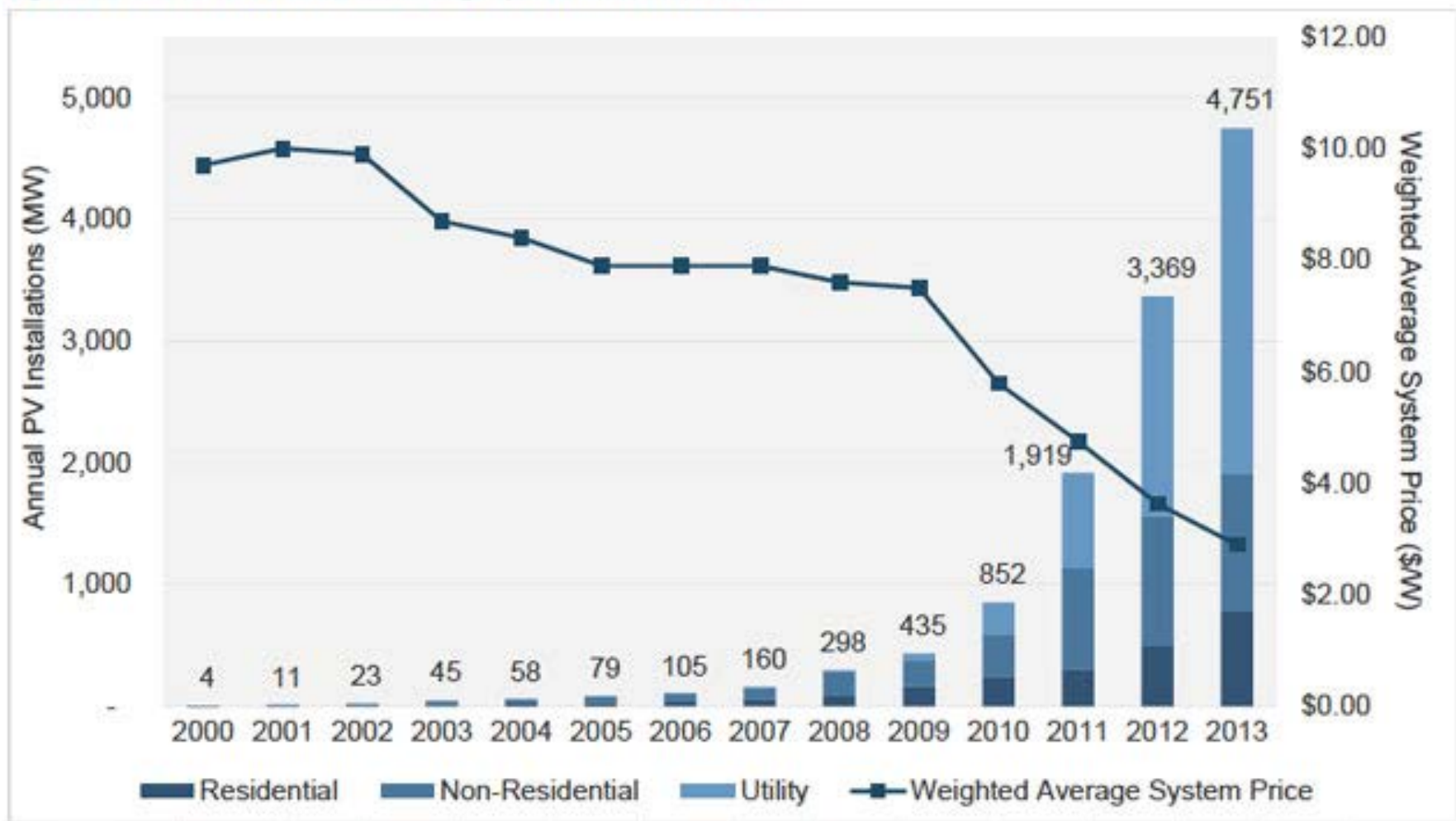
# Hype Cycle Indicators

expectations



# US PV Installations and Price

Figure 2.1 U.S. PV Installations and Average System Price, 2000-2013



Sources: Solar Energy Industries Association. 2014. US Solar Market Insight: 2013 Year in Review

# US PV Market Characteristics

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- The US has 15.9 gigawatts of solar power, enough to power the equivalent of 3.2 million average homes.
- A solar project was installed every 4 min in 2013.
- In 2013 and 2014, solar was the second-largest source of new electricity generating capacity in U.S.
- Many companies are deploying solar in a massive scale, including Apple, Berkshire Hathaway, FedEx, GE, GM, Google, Target, Walmart, and U.S. military.
- Since 2010, the average installed cost of solar PV has dropped by about 50 percent.

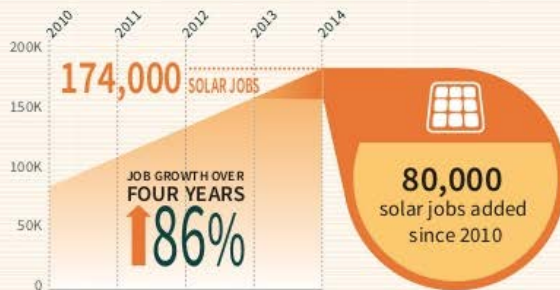
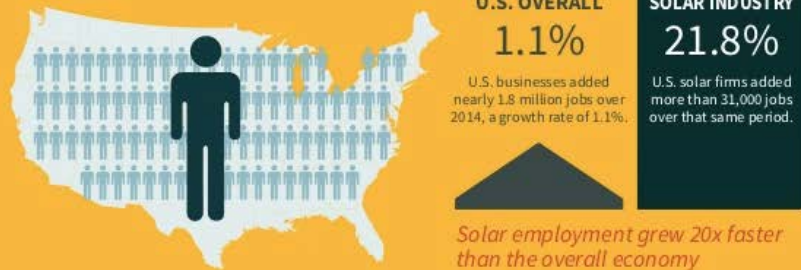


# SOLAR INDUSTRY JOBS 2014

THE U.S. SOLAR INDUSTRY HAD A GREAT YEAR, AND 2015 LOOKS EQUALLY BRIGHT!

## 2014 JOB GROWTH

One out of every 78 new jobs was created by the solar industry



### PROJECTED 2015 GROWTH:

**20.9%**

SOLAR EMPLOYERS exceeded their predictions in each of the last two years by **2.7%** and **6.2%** RESPECTIVELY

### BY COMPARISON...

2015 Solar Jobs Growth Forecast

**8x GREATER**

than Oil, Gas & Coal  
**COMBINED**

### TOTAL JOBS BY TYPE



Full details in The Solar Foundation's  
National Solar Job Census 2014 at:

[www.tsfcensus.org](http://www.tsfcensus.org)

The **SOLAR**  
FOUNDATION  
RESEARCH • EDUCATION • TO ACCELERATE SOLAR ENERGY

- Nation + 31,000 (total 173,000)
- California + 7,500 (total 54,690)
- Mass. + 3,000 (total 9,400)
- Nevada + 2,500 (total 5,900)
- Illinois + 1,700 (total 3,800)
- Minnesota + 936 (total 1,800)
- Wisconsin + 100 (total 1,900)

# Midwest PV Market Characteristics

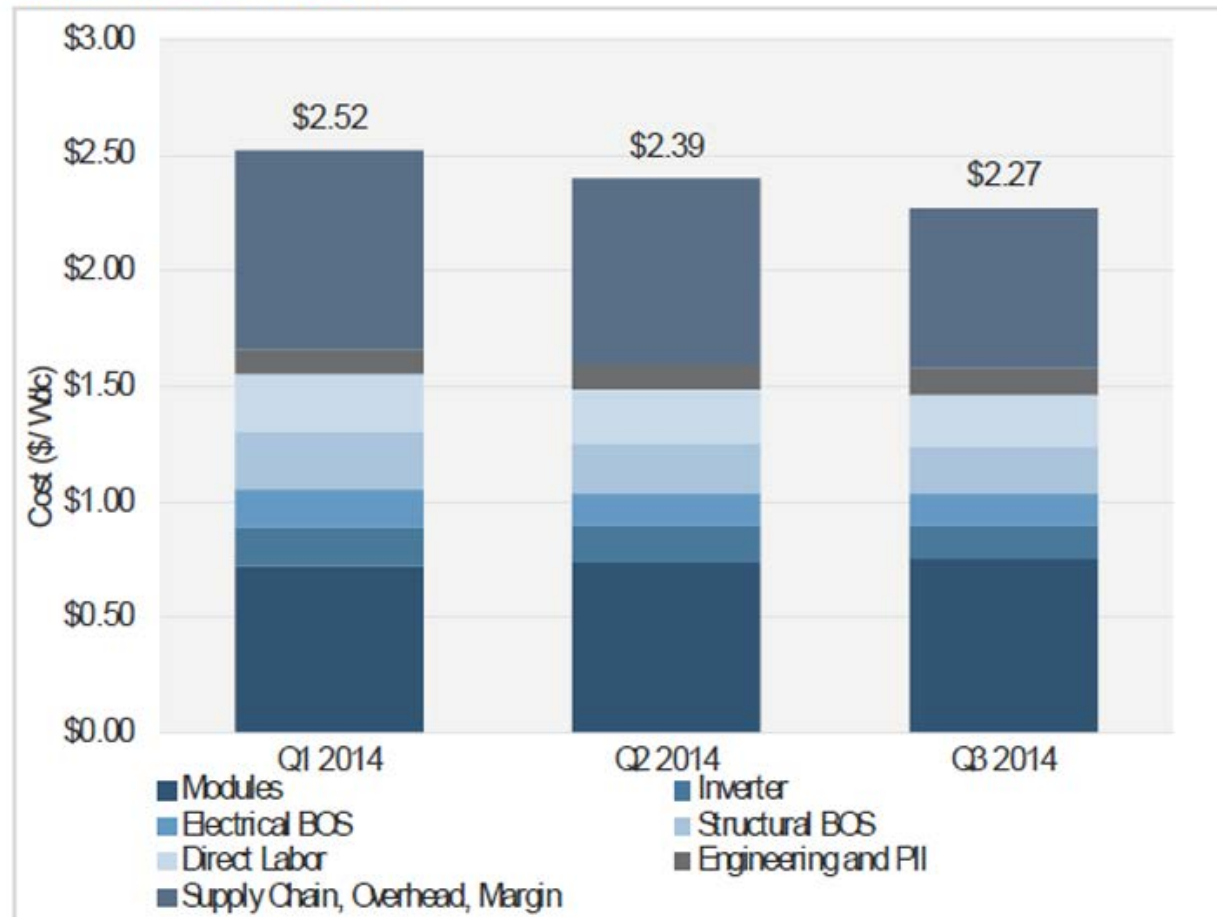
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- 3% of national installed capacity
- Of that, only 2% is residential
- Fastest growing market (%) in the US
- Moderate to high utility rates with good time-of-use rates
- Diverse utility, policy, and approvals landscape
- Increasingly aggressive utility position against DG
- Diverse small business landscape with significant manufacturing and distribution
- Low understanding of the applications/returns of solar in residential and commercial space



# Commercial and Industrial PV Pricing

Figure 2.6 Modeled Non-Residential Turnkey Rooftop PV System Pricing With Cost Breakdown, Q1 2014-Q3 2014

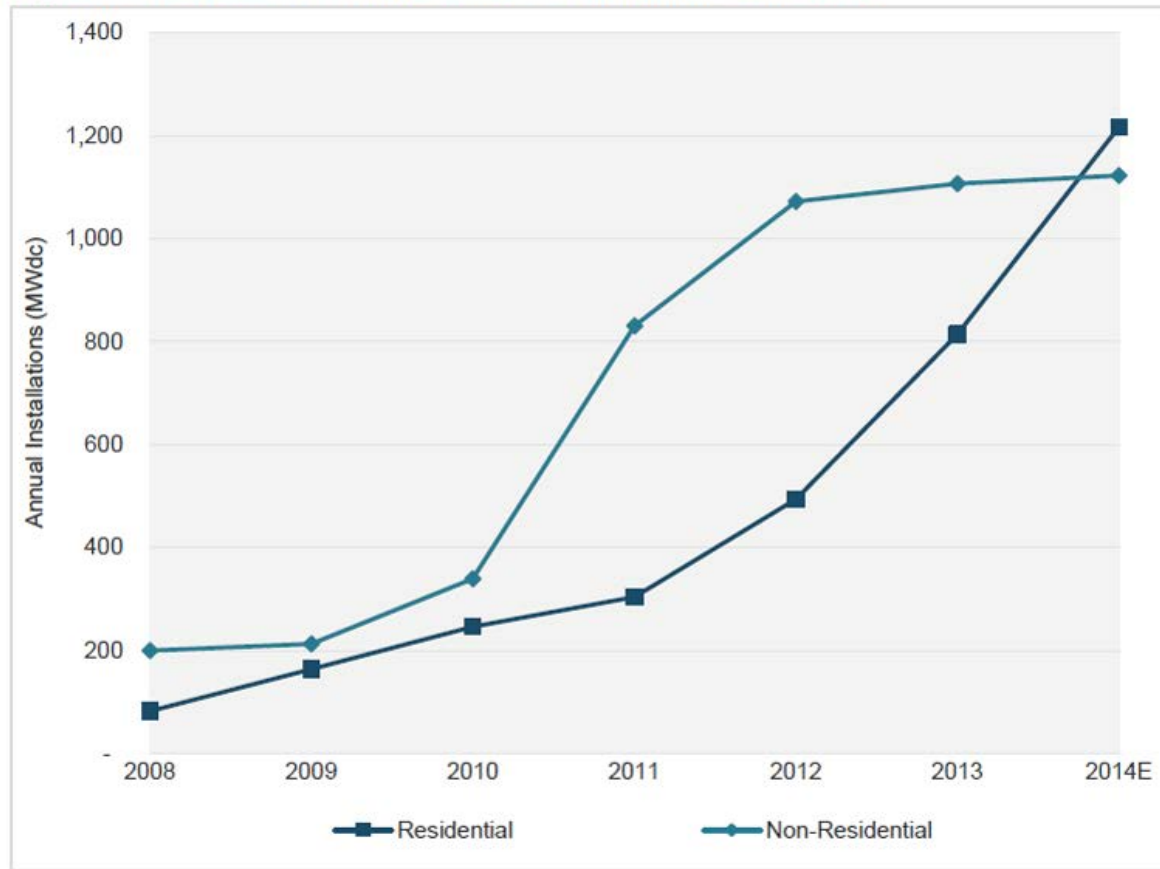


Note: Assumes a 200 kWdc to 300 kWdc rooftop system, standard crystalline silicon modules, string inverter, flat roof without obstructions with an average inverter loading ratio (ILR) of 1.15.



# US Residential vs Commercial Growth

Figure 1.2 Residential vs. Non-Residential PV Installations, 2008-2014E



# C&I PV Deployment Challenges

- Site Assessment
- Approvals
- Origination



Brown University, Rhode Island



# University (+) Column

1. Approaching \$500 Billion in Investments
2. Regulatory certainty for fund managers
3. Considerations for 'programmatic' assets
4. Accustomed to real estate investments
5. Business case for reducing operating costs
6. Campus sustainability charters
7. Divestment and issue visibility
8. Established leadership by peer campuses



# Notable University PV Investments

- ASU (24MW)
- Rutgers (8MW)
- Cornell (2MW)
- More than 215 MW at 320+ campuses



Rutgers University, New Jersey



# University (-) Column

1. Complexity of campus energy footprint
2. Complexity of campus approvals
3. Density of university governance and decision-making
4. Project design and comparable ROI



# The Solar Endowment: Strategy

1. Student Deployment Teams
2. Solar Technical Assistance Team (STAT)
3. Campus technical and financial potential
4. Campus deployment goals
5. University investment goals
6. Model RFP and approvals
7. Case Studies and Roadmap



# University Partners

1. Illinois State University
2. Missouri University of Science and Tech
3. University of Minnesota
4. Purdue University



# C&I Site Assessment Certificate

Market relevant certificate that facilitates PV deployment on partnering university campuses

- Knowledge, skills, and abilities to determine PV technical and financial potential
- Online courses that allow for independent study and facilitate engagement between Student Deployment Teams and the Solar Technical Assistance Team (STAT).



Site Assessment  
Certificate Program

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# Solar Technical Assistance Team (STAT)

1. Site assessment tech mentor network
2. Legal and regulatory analysis
3. Campus stakeholder engagement
4. Project financial analysis and design
5. PV investment value and risk



# Solar University (SUN) Delegations

- 5 events over next 2 years
- Site visits, tours, conferences
- Campus leadership and stakeholders
- Powered by SunShot



Empowering campuses to grow solar



# THE SOLAR ENDOWMENT

providing long-term support  
and producing clean, local electrons every time the sun shines

# Solar Endowment Finance Models

1. Load reduction vs PPA
2. Major donor 'Flip'
3. Campus shared solar
4. Campus utility deployment
5. Energy performance contracting
6. University foundation procurement



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# Midwest Renewable Energy Association

[www.midwestrenew.org](http://www.midwestrenew.org)



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