ARPA-E University Webinar:

“Charitable Investment for Energy Innovation 101”

Presenters:

Nate Gorence  
Tech-to-Market Advisor

David Bank  
Founder

Sarah Kearney  
Founder & Executive Director
45-MIN WEBINAR AGENDA

› 5 minutes: Nate Gorence, ARPA-E
  • ARPA-E’s Mission and Goals
  • Overview of early-stage finance ecosystem for energy RD&D

› 15 minutes: David Bank, ImpactAlpha
  • Overview of program-related investing
  • PRI case studies from other sectors

› 15 minutes: Sarah Kearney, PRIME Coalition
  • Charitable investing to support clean energy
  • Mission and approach of PRIME, including case studies

› 10 minutes: Nate Moderates Q&A with David and Sarah
ARPA-E MISSION

**Goals:** Ensure America’s:
- Energy Security
- Energy Sustainability
- Economic Security
- Technological Lead in Advanced Energy Technologies

**Mission:** Catalyze the development of early stage transformational, high-impact energy technologies that could provide dramatic benefits

- Reduce Energy Imports
- Improve Energy Efficiency
- Reduce Energy Emissions
CREATING NEW LEARNING CURVES

Transformative Research

Existing Technology

Disruptive Technology

COST / PERFORMANCE

TIME OR SCALE
IF IT WORKS…

WILL IT MATTER?
MEASURING SUCCESS

- Invested approximately $1.3 billion over 7 years
  - 36 focused programs and three open funding solicitations
  - >500 projects under contract, >200 alumni projects

45 projects have attracted $1.25B+ from the private sector

36 new companies formed

60 government projects
WHAT WE REALLY WANT: MARKET PRODUCTS
VC investment in early stage clean-tech 2011 – 2015*

2015 Survey: “Only 5 percent [of LPs] said they were going to focus on green-focused funds, the second-lowest category…”

Source: https://www.greentechmedia.com/articles/read/where-are-the-green-unicorns-theyre-not-in-the-traditional-venture-capital

Source: Cyclotron Road analysis of PWHC/NVCA Thompson Reuters report
Opportunity: Find new sources of capital

Asset Owners:
- Foundation grants/PRIs
- Family offices
- Donor Advised Funds (DAFs)
- High Net Worth Individuals (HNWIs)
- Endowments
- Pensions
- Sovereign Funds
- Corporations

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Program-Related Investments: Catalytic Capital for Early-Stage Innovation
Capital doesn’t always flow where it’s needed

• Smallholder farmers
• Small and medium-sized enterprises
• Affordable housing and community development
• Neglected disease R&D and commercialization
• Conservation

AND...

• Early-stage climate innovation
Strategic investors are deploying capital to reduce risks, increase returns

- Demonstrate sector, market and enterprise viability;
- Mitigate risk and enable financial innovation;
- Create a track record to change risk perceptions;
- Bundle investments to diversify risk;
- Provide a financial hedge or subsidy to attract large-scale, mainstream investment.
Program-related investments (PRIs): Flexible, patient, concessionary capital

*Foundation Investments to support charitable activities that involve the potential return of capital within an established time frame*

**IRS requirements:**

1. The primary purpose is charitable
2. Financial return is not a significant purpose
3. Influencing legislation is not a purpose.
Low-interest loans

- Packard Foundation
- $10 million, 7.5 years, 1% loan
- Lowers cost of capital
- Crowds in commercial investors
- Demonstrates market potential

Ecotrust Forest: Making the Math Work for Sustainable Timber in the Northwest

CONSERVATION FINANCE

IMPACTALPHA
INVESTMENT NEWS FOR A SUSTAINABLE EDGE
Direct early-stage equity

- Gates Foundation
- Kymab (transgenic mouse platform)
- $20 million equity investment
- $3.7 million in research grants
- High-risk
- Global Access Agreement
Indirect equity investments

- DBL Partners I: $75 million
  - Ford, Casey, MacArthur, Heron foundations
  - Tesla, Solar City, Revolution Foods
- DBL Partners II: $150 million
- DBL Partners III: $400 million.
  - Off-Grid Solar
  - Advanced Micro-Grid Solutions
Philanthropic leaders, but few followers

- 80,000 U.S. Foundations making roughly $50 billion each year in grants
- 487 foundations made 3,728 PRIs totaling $3.76 billion (since 2003)
- Less than 1% of foundations make PRIS and on average dedicate only half of 1% of their grant budgets
2016 guidance from the IRS

- New examples of qualifying PRIs:
  - Disease research
  - Environment
  - Education
  - Smallholder agriculture
  - Use of loan guarantees
For Entrepreneurs

• Educate yourself (PRI requirements)
• Identify your impact and how to measure it
• Find the right investor or educate the ones you have
• Don’t forget grants
• Beware (hidden) costs of capital
For co-investors

- **Access** low-cost capital
- **Enhance** reputation
- **Share** and mitigate risks
- **Gain** industry and market expertise
- **Beware** strategic investors
- **Assess** charitable requirements
- **Get ready** for bureaucratic lag
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Capital gaps along the energy innovation and deployment pipeline are holding us back.
One acute problem is that no one is willing to go FIRST in supporting early-stage energy innovators.

**US Venture Capital**

(Q4 2015)

$4.5B
SOFTWARE

$1.5B
BIOTECH

$300M
CLEANTECH
Philanthropists are uniquely positioned to step in and catalyze investment.

<table>
<thead>
<tr>
<th></th>
<th>Venture Capital</th>
<th>Bond Investors</th>
<th>Government</th>
<th>PRI</th>
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<tr>
<td>long return time</td>
<td>X</td>
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<tr>
<td>high risk investment</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>company building</td>
<td></td>
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<td>X</td>
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But nobody’s doing it…

- 5,861 PRIs on record (1969-2014)
- 172 (3%) PRIs pertain to science and engineering innovation
- 33 of those (0.6%) pertain to climate change mitigation.

- 2,863 organizations received PRIs
- 87 (3%) recipients pertain to S&E innovation
- 19 of those (0.7%) pertain to climate change mitigation.

- 686 foundations made PRIs
- 44 (6%) PRI-makers relevant to S&E innovation
- 12 of those (2%) made PRIs that pertain to climate change mitigation.
The marketplace of charitable investors is large, but idiosyncratic, fragmented, and inaccessible to energy innovators.

<table>
<thead>
<tr>
<th>Annual grants</th>
<th>Private Foundation</th>
<th>Donor Advised Funds (DAFs)</th>
<th>Corporate Giving</th>
</tr>
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<tr>
<td>$50B</td>
<td>$13B</td>
<td>$19B</td>
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</table>

| Assets        | $600B              | $70B                       |

<.01% of all grants went to energy innovation in 2014


Sarah Kearney, PRIME Coalition
September 8, 2016
ARPA-E University Webinar
High barriers prevent philanthropists from investing directly into early-stage ventures today – here’s what we heard during our listening tour in 2013.

I didn’t know I could use my grant dollars to make for-profit investments.

My grant team is not organizationally structured to behave like a for-profit investment firm.

I thought that’s what venture capital was doing.

I’m inundated with investment opportunities and it’s very difficult to know which might actually need philanthropic intervention.

I can’t find any examples of other grant-makers making investments like this in the field.

How can I be sure that this is the best use of my philanthropy, or that a specific investment might actually help solve the climate problem?

I’m not a technical expert – I need support on technical due diligence. How much would that cost to do right?

Would I potentially get in trouble with the IRS if I break the rules? How can I know with certainty that something qualifies as charitable?

Once I find a company I might want to support, I can’t convince my own accountants, attorneys and advisors to let me do it with charitable capital.

Is it true that there are good investments dying on the vine?

I don’t know where to look for co-investors or follow-on investors – I don’t want to be out on a limb by myself.

Sarah Kearney, PRIME Coalition
September 8, 2016
ARPA-E University Webinar

Quotes recorded during PRIME market research, 2013.
PRIME was purpose-built in 2014 to lower today’s barriers and unlock philanthropic investment for climate change mitigation.
Since 2014, pioneering philanthropic partners have supported:

1. PRIME’s nonprofit programming with traditional grants
   - MacArthur Foundation
   - W. K. Kellogg Foundation
   - Echoing Green
   - Blue Haven Initiative
   - Stiefel Family Foundation
   - Pritzker Innovation Fund

2. PRIME’s docket companies with charitable investment capital
   - SORENSON IMPACT Foundation
   - The Boston Foundation
   - JUST Better for everyone
PRIME’s mission, vision and Theory of Change led us to focus on two core programs in the near-term:

1. facilitate demonstrative investments

2. build connectivity between philanthropists and climate innovators
We’ve learned a lot about the mechanics of placing charitable capital into early-stage energy companies along the way, here are all options today!

<table>
<thead>
<tr>
<th>Philanthropic Organization Type</th>
<th>Type of Support</th>
<th>Transaction Mechanism</th>
<th>Recipient of Capital (corporate form)</th>
<th>With whom does philanthropist negotiate terms?</th>
<th>Who makes capital expenditure decisions?</th>
<th>Use of capital</th>
<th>Who does follow-on monitoring (business &amp; impact)?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GRANT-MAKING FOUNDATION</strong></td>
<td>Operating support to PRIME</td>
<td>Grant</td>
<td>PRIME (501c3)</td>
<td>PRIME</td>
<td>PRIME</td>
<td>nonprofit programming and/or docket company support</td>
<td>Foundation</td>
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<tr>
<td>Docket company support - PRIME as pass-through</td>
<td>Recoverable Grant</td>
<td>PRIME (501c3)</td>
<td>PRIME</td>
<td>Docket company</td>
<td>specific company development</td>
<td>PRIME</td>
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<td></td>
<td>Loan - PRI</td>
<td>PRIME (501c3)</td>
<td>PRIME</td>
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<td></td>
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<td><strong>GRANT-MAKING PUBLIC CHARITY</strong></td>
<td>Operating support to PRIME</td>
<td>Grant</td>
<td>PRIME (501c3)</td>
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<td>nonprofit programming and/or docket company support</td>
<td>Grantor</td>
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<tr>
<td>Support for docket companies - PRIME as pass-through</td>
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<td><strong>DONOR ADVISED FUND (DAF)</strong></td>
<td>Operating support to PRIME</td>
<td>Grant</td>
<td>PRIME (501c3)</td>
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<td>DAF manager</td>
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<td><strong>OTHER ACCREDITED INVESTOR</strong></td>
<td>Operating support to PRIME</td>
<td>Donation</td>
<td>PRIME (501c3)</td>
<td>PRIME</td>
<td>PRIME</td>
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<td>Donor</td>
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<td>PRIME</td>
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<td><strong>UNACCREDITED INVESTOR</strong></td>
<td>Operating support to PRIME</td>
<td>Donation</td>
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Quidnet Energy: PRIME’s first proof-of-concept investment

ACCREDITED HOUSEHOLD

SORENSON IMPACT FOUNDATION

WILL & JADA SMITH FOUNDATION

PRIME (public charity)

QUIDNET (energy storage startup)

~$1M Seed Round

Convertible Note

Convertible Note (PRI)

Recoverable Grant

Recoverable Grant
RedWave Energy: PRIME’s second demonstrative investment

BLUE HAVEN INITIATIVE
   (single family office)

DAF

BOSTON FOUNDATION

DAF

WILL & JADA SMITH FOUNDATION

PRIME
   (public charity)

JUST GOODS

REDWAVE
   (waste heat to electricity company)

$5.85M Series B Round

Equity

Loan

Recoverable Grant

Recoverable Grant

Recoverable Grant

Recoverable Grant

Sarah Kearney, PRIME Coalition
September 8, 2016
ARPA-E University Webinar
PRIME’s 2016 docket was selected from 2015 Registry of 1,300 companies…

membranes that reduce the cost and energy of desalination and water treatment

meter collar that enables solar and other renewable resources to connect to the grid cheaply, safely, and rapidly

grid control software that enables efficient management of grids and microgrids

ultra-high-efficiency, low-cost solar material

affordable, distributed, carbon-free nuclear power
Ways energy innovators can be proactive in seeking philanthropic investment in the near-term:

Level set about FOMO – philanthropic investment in energy not really happening yet

Make sure you’re in the PRIME Registry via www.primecoalition.org

Check out PRIME’s tools to help you construct your own argument for ”charitability”

Attend PRIME’s in-person training sessions for entrepreneurs

Once you’re in the door with a philanthropist, come back to us – we can help with peer-to-peer validation!

Reach out to Scott Burger, PRIME’s Director of Operations – scott@primecoalition.org
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