Feeding the World Through Digital Agriculture
ASHLEY GROSH
VP Sr. Relationship Manager, Corporate Clean Tech Banking Group, Wells Fargo
IN² By The Numbers

$668,000
in follow-on funding distributed to date

$86.65 million
raised from external follow-on funding

20 Portfolio Companies

20 Portfolio Companies to date

ESS
LiquidCool Solutions
Whisker Labs
VGSmartGlass
Polyceed
heliotrope
NETenergy
Go Electric
7AC Technologies
THERMOLIFT
EDGEPOWER
Geli
transformativewave
7is networks
J2 Innovations
simuwatt
POWERFLEX SYSTEMS
APANA
maalka
Fostering a Cleantech Ecosystem

Channel Partners

ACRE | New York, NY
Caltech, Flow Program | Los Angeles, CA
Carnegie Mellon University | Pittsburgh, PA
Case Western Reserve University | Cleveland, OH
Clean Energy Trust | Chicago, IL
Cleantech Group | New York, NY
Cleantech Open | Redwood City, CA
Coachella Valley Economic Partnership | Palm Springs, CA
Colorado State University Energy Institute, Powerhouse | Fort Collins, CO
Cyclotron Road | Berkeley, CA
Elemental Exelcrator | Honolulu, HI
Greentown Labs | Boston, MA
Imagine H2O Inc. | San Francisco, CA
Innosphere | Fort Collins, CO
Los Angeles Cleantech Incubator | Los Angeles, CA
Mass Challenge | Boston, MA
MIT Energy Club | Boston, MA
NextEnergy Center | Detroit, MI
Northeast Clean Energy Council (NECEC) Institute | Boston, MA
Northwestern University | Evanston, IL
Oregon BEST | Portland, OR
Portland State University Foundation | Portland, OR
Prospect SV | San Jose, CA
Purdue University | West Lafayette, IN
Rice University | Houston, TX
Stanford, TomKat Center for Sustainable Energy | Stanford, CA
Sustainable Startups | Salt Lake City, UT
Telluride Venture Accelerator | Telluride, CO
Texas A&M Engineering Experiment Station
Clean Energy Incubator (TAMCEI) | College Station, TX
Texas State University | San Marcos, TX
The Water Council | Milwaukee, WI
UC Berkeley | Berkeley, CA
UNC Charlotte | Charlotte, NC
University of California, Davis Energy Efficiency Center (EEC) | Davis, CA
University of California, Irvine | Irvine, CA
University of California, San Diego | San Diego, CA
University of Colorado Boulder; Renewable and Sustainable Energy Institute (RASEI) | Boulder, CO
University of Denver | Denver, CO
University of Michigan | Ann Arbor, MI
University of Texas at Austin, Austin Technology Incubator (ATI) | Austin, TX
University of Texas at Austin, McCombs School of Business | Austin, TX
University of Washington | Seattle, WA
University of Wisconsin-Madison, Wisconsin Energy Institute | Madison, WI
Wells Fargo committed an additional $20M through 2020 to expand the IN² program!

2014
Round 1
2015
Round 2
2016
Round 3
2017
Discovery Phase
2018
Round 4
2019
Start of IN² 2.0
Round 5 companies to be selected as well as the introduction of a new vertical
2020
Round 6 companies to be selected as well as the introduction of a new vertical

IN² will continue to grow along the commercial building track while adding new verticals each year, driving us towards a more sustainable future.
Feeding the World Through Digital Agriculture

MODERATOR: LAURA SHENKAR
Founder and Principal, Artemis Water Strategy

WADE BARNES
President & CEO, Farmers Edge

CHUCK TEMPLETON
Managing Director

ROB O’REILLY
Senior Technical Staff Precision Ag and Industrial Monitoring, Analog Devices

CHRIS PATERSON
Digital Farming Lead for North America, Bayer CropScience

Co-Hosted by: NEXT-GEN: FOOD & AG

#cleantechSF
Cleantech in the Soil to Shelf Economy

January 24, 2018
San Francisco, CA
Laura Shenkar, Artemis Water Strategy
Beyond Plans and Pilots.
Real World Water Resilience
Stakeholders for 21st Century Water

- Corporate Water Users
- Public Policy/Economic Development
- Water Technology Companies
- Investors
- Water Utilities

The Artemis Water Strategy – Proprietary
January 24, 2018
Tectonic Shifts in US Farming

US Farm Crisis

Rise of Identity Foods

Market Glut, Followed by Shortfall

Technological Development= Wave of new offerings

Investment Opportunity

Resource Scarcity: Soil, Water, Energy

The Artemis Water Strategy – Proprietary
2017 Farm Income Drops 50%, Debt Rises

Real (2009 USD) Returns To Farm Operators, 1970-2017F
Farm to Fork Emerges as a Cleantech Opportunity

Global Venture Investments in Agriculture & Food

First signs of a new cleantech investment opportunity?

Source: Cleantech Group
US Agtech Innovators in the Field

Roric Paulman, Sutherland, Nebraska

Randy McGee, Idalou, Texas
Gaviria hopes his Mexican maize becomes the next grain craze. He imports more than 1,300 tons for high-end restaurants like Cosme, in New York. Gaviria developed a taste for the best ingredients cooking at Maialino and Blue Hill at Stone Barns.
Health and Safety Drive Direct Ties from Consumer to Farmer

For the first time in history, the consumer is beginning to drive agricultural acreage

- Customers are starting to shift supply chains:
  - Whole Foods’ announcement last spring that it would require GMO labels on products in its stores by 2018 is also driving demand for non-GMO feed
  - Chipotle and Panera Bread announced plans to eliminate non-GMO and other “artificial inputs” from their menus
- Organic meat and poultry sales growth versus conventional provide some context for row crop agriculture as well
- Identify supply and demand gaps (in the case below organic gaps) create a need for identity specific acreage

Double Digit Organic Growth

<table>
<thead>
<tr>
<th>Organic Food Segments – Sales CAGR (2005-2014E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat &amp; Poultry</td>
</tr>
<tr>
<td>Dairy</td>
</tr>
<tr>
<td>Seafood</td>
</tr>
<tr>
<td>Fresh Vegetables</td>
</tr>
<tr>
<td>Fruits &amp; Berries</td>
</tr>
<tr>
<td>Bread &amp; Cereal</td>
</tr>
<tr>
<td>Beverages</td>
</tr>
<tr>
<td>Prepared Foods</td>
</tr>
</tbody>
</table>

Source: USDA

Organic Growth Rate vs Farmland Conversion

Demand by organic food growing at 14% per year
Supply of US organic cropland growing at 8% a year

The Artemis Water Strategy – Proprietary
January 24, 2018
Institutional Investors

Annual Unlisted Agriculture/Farmland-Focused Fundraising (2006-2015)*

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Funds Closed</th>
<th>Aggregate Capital Raised</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>8</td>
<td>0.3</td>
</tr>
<tr>
<td>2007</td>
<td>7</td>
<td>2.7</td>
</tr>
<tr>
<td>2008</td>
<td>4</td>
<td>1.4</td>
</tr>
<tr>
<td>2009</td>
<td>5</td>
<td>0.5</td>
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<tr>
<td>2010</td>
<td>10</td>
<td>1.3</td>
</tr>
<tr>
<td>2011</td>
<td>14</td>
<td>2.3</td>
</tr>
<tr>
<td>2012</td>
<td>13</td>
<td>3.8</td>
</tr>
<tr>
<td>2013</td>
<td>17</td>
<td>1.5</td>
</tr>
<tr>
<td>2014</td>
<td>17</td>
<td>3.9</td>
</tr>
<tr>
<td>2015</td>
<td>9</td>
<td>3.9</td>
</tr>
</tbody>
</table>

* Source: Preqin Natural Resources Online

Capital Raised by Unlisted Agriculture/Farmland-Focused Funds Closed since 2006 by Primary Geographic Focus

- North America: 26%
- Africa: 9%
- Asia: 7%
- Middle East & Israel: 35%
- Latin America: 7%
- Australia: 5%
- Europe: 8%
- Unspecified Multi-Regional: 1%
A Confluence of New Technologies

The Cost of IoT Sensors is Falling...

2004 average cost: $1.30

2020 average cost forecast: $0.38

1.7 M new industrial robots by 2020

Smart phones and Tablets Usage

Cost and Lifetime for LED lighting
Cleantech revolution in ag?

• What kinds of data is helping open up the buyers' end of the market?
• What are the critical data ontology, communications, and hardware gaps that will be decisive in the first stage of this market?
• Trend vs. Fad? Specialty food? Identity Crops? (Organic, gluten-free)
What’s the matter with tomatoes sold in Boston?
What’s the matter with tomatoes sold in Boston?

They taste like chalk …
What’s the matter with tomatoes sold in Boston? …because they’re grown industrially as little green golf balls...
What’s the matter with tomatoes sold in Boston? ...
... and low-tech ethylene gas is applied on the way to Boston.
Tomatoes are imported from weird places.

California has no water.
Tomatoes are imported from weird places.

Florida has no soil
Tomatoes are imported from weird places.

Other tomato regions of the world have dubious labor and environmental practices.
We want more locally-produced tomatoes!

This requires supporting the success and growth of local tomato farmers.
Internet of Tomatoes

Goal: Reconcile Productivity and Taste

PRODUCTIVITY
✓ No disease
✓ Maximum yield
✓ Right water
✓ Right heat
✓ Right soil
✓ Right light
✓ When to harvest

TASTE
✓ Sweet
✓ Acid
✓ Low water content
✓ Salt

Argus C
Boots on the Ground

Monitoring on the Vine

ADI Smart Ag Farm

In-Field Monitors

Verrill Farms

Consumer
The Full Chain

Data Mashup
Digital Ag – Still the Beginning of the Beginning

The Benefits
- Reduced water usage – up to 20%
- More accurate pest and mold prediction
- Increased yield
- Better taste
- Score Card Generation

The Challenges
- Supply Chain
- Distribution
- Support
Join us to make **Boston** the hub of the next technology revolution: **Ag-Food-Tech**
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Sustainable Food System – Bridging the Gap Between Farm and Table
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Managing Director, Obvious Ventures

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Co-founder and CEO, Clear Labs

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Managing Director, AeroFarms

CHRIS MALLET
Corporate Vice President, Research & Development, Cargill

WILL ROENZWEIG
Founder and Chair, Food Venture Lab

MICHAEL SELDEN
CEO & Co-Founder, Finless Foods

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Agricultural & food sector continues to see venture investments

Dollars (left) and volume (right) of global agriculture & food venture capital deal activity

*Excludes outlier deals above $350M
Disruption Intensity: who’s feeling it most right now? where’s the momentum?

Utilities exhibit a long, steady burn, but the real intensity in growth rates of open innovation are today found around Transportation & Logistics, and Ag and Food.

Sustainable food system – VC and corporate recent activities
Sustainable Food System – Bridging the Gap Between Farm and Table

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Biotechnology Applications in Agriculture & Food
Cleantech Forum | San Francisco

Biotechnology Applications in Agriculture & Food

MODERATOR: ANDREW HAUGHIAN
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ENA CRATSENBURG
Chief Business Officer, Ginkgo Bioworks

MATTHEW CRISP
President & CEO, Benson Hill Biosystems

VONNIE ESTES
Independent Consultant

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Managing Partner, Spruce Capital Partners

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