Accelerating Dow’s Innovation Agenda

ACS Entrepreneurial Summit

Doug White – Director
Dow Ventures and Business Development
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Dow: An Innovation Company

Founded in 1897
117 years of growth

Largest chemical company in the U.S.
Ranked 68th in the S&P Fortune 500

$57 billion in annual revenue in 2013
~ 53,000 employees worldwide

Integrated value chains aligned to high-growth sectors

6,000 products manufactured at 201 sites in 36 countries across the globe
Portfolio Aimed at Addressing Society’s Needs

Agricultural Sciences
- Crop Protection
- Seeds
- Revenue: $7.2B
- Adj. EBITDA: $0.9B

Consumer Solutions
- Consumer Care
- Dow Automotive Systems
- Dow Electronic Materials
- Revenue: $4.6B
- Adj. EBITDA: $1.0B

Infrastructure Solutions
- Dow Building & Construction
- Dow Coating Materials
- Energy & Water Solutions
- Performance Monomers
- Revenue: $8.5B
- Adj. EBITDA: $1.1B

Performance Materials & Chemicals
- Chlor Alkali and Vinyl
- Chlorinated Organics
- Epoxy
- Industrial Solutions
- Polyurethanes
- Revenue: $14.9B
- Adj. EBITDA: $2.1B

Performance Plastics
- Dow Elastomers
- Dow Electrical and Telecommunications
- Dow Packaging and Specialty Plastics
- Energy
- Hydrocarbons
- Revenue: $22.6B
- Adj. EBITDA: $4.4B

Enhancing Value through Operational Excellence, Sustainability & Innovation and Investments in Integrated and Feedstock-Driven Value Chains

3Q14 Trailing Twelve Months Revenue and Adj. EBITDA data
Delivering Breakthroughs to World Challenges

**Food:**
Omega-9 Healthy Oils

**Water:**
DOW FILMTEC™ ECO Reverse Osmosis Elements

**Transportation:**
BETAMATE™ Structural Adhesives

**Health:**
POLYOX™ Water-Soluble Polymers in Lifebuoy™ Soap

~1.5 billion pounds of trans and saturated fat eliminated

40% better purification with 30% less energy

23.3 million metric tons of CO₂ emission avoidance

45% reduction in preventable disease from handwashing with soap
Dow Corporate Venturing

- Identifies / analyzes new technologies and quantifies new market opportunities for Dow

- Serves as an innovation pipeline to supply Dow with a flow of new concepts for evaluation

- Seeks interaction with emerging technology sources, focusing on developing strategic relationships

- Staff includes technical, commercial, and financial analysts

- Uses Technology Scouting group to identify, interact with emerging technology-based opportunities
Opportunities to which Dow brings differentiating competitive advantage through partnering/investing:

- **R&D:** access to raw materials, testing, technical assistance, modeling, high throughput research, product development, intellectual property
- **Marketing:** access to global market channels, customers and their needs, business intelligence, Dow brand equity
- **Manufacturing:** access to global manufacturing resources, scale-up, supply chain

Generally, these opportunities are based on innovations in materials or chemistry
Dow Technical Scouting

- Building connections to the emerging technology marketplace
- Identifying value creation opportunities at an early stage
- Matching market need recognition and key technology inventions
- Strengthening relationships with sponsored university/national lab research and their start-up spin-offs
- Identifying incubators and matchmaker programs that foster early-stage technology-focused business entities
- Building global scouting networks customized to geographic region
Technical Scouting Deployment

- West Coast
- Gulf Coast/Mountain
- East Coast
- Europe
- India
- Pacific

- Steve Hahn
- Leigh Thompson
- Patricia Ansems Bancroft
- Ed Greer
- Joost Waeterloos
- Chedarampet Karthikeyan
- Hongmei Zhang
- Doug White (Global)
The rich idea space occurs at the intersection of technology innovation and commercialization.
Key Elements for Opportunity Identification

**Success Factors for Dow**
- Visible entry points to champion concept
- Connection with national/state organizations focused on commercializing start-ups
- Communication of main technology challenges and interests
- Clear/developed project scenarios/milestones with start-up

**Success Factors for Start-ups**
- Clear value proposition and compelling disruptive technology
- Sufficient and business-friendly IP coverage
- Milestone-driven scale-up plan, with assessment of competitive technologies and market potential
- Advisory boards of independent experts in the field

**Depending on business model / interests, strategic fit and project success, outcome could range anywhere from JDA, licensing, acquisition or decision not to pursue.**
Dow Venture Capital

- Continuously active investor since 1993
- Invests directly in attractive start-up companies around the world when needed to support strategic relationship with a sponsoring Dow business
- Strategic sectors of interest span multiple industries and technologies
- Add value as a strategic investor while enabling and accelerating Dow growth
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<th><strong>Examples of Valuable Ventures</strong></th>
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<td><strong>Clean Filtration Technologies, Inc.</strong></td>
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<td><strong>Leadership in providing breakthrough, scalable, safe and affordable water solutions to the underserved through innovative business models</strong></td>
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<td><strong>BLADE DYNAMICS</strong></td>
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<td><strong>Innovative, advanced rotor technology for wind turbines, enabling blades longer than 80 meters, enhancing transportation ease and quality, while reducing weight &amp; cost</strong></td>
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<td><strong>NuvoSun</strong></td>
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<td><strong>Innovator of thin-film photovoltaic (PV) cells and modules based on flexible CIGS technology and an ultra-low cost proprietary manufacturing process and equipment</strong></td>
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<tr>
<td><strong>waterhealth</strong></td>
</tr>
<tr>
<td><strong>Leadership in providing breakthrough, scalable, safe and affordable water solutions to the underserved through innovative business models</strong></td>
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<tr>
<td><strong>LIGHTSCAPE materials, Inc.</strong></td>
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<td><strong>Developing and supplying a variety of high-quality novel phosphor solutions engineered specifically for the LED lighting industry.</strong></td>
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<tr>
<td><strong>STABLCOR®</strong></td>
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<td><strong>Developed a carbon composite laminate that, when embedded into a PCB, allows electronic devices to exceed the thermo-mechanical limitations of current materials.</strong></td>
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<td><strong>ynpromics</strong></td>
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<td><strong>Developing a series of synthetic gene regulators that are active only under that specific profile, currently working with DAS to demonstrate the technology in crops</strong></td>
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Invest for mutual value creation – for stakeholders and Dow

- Solid teams with defensible, compelling technologies and credible business models
- Across all stages of development – from seed to late stage

Take an active role

- Lead deals or invest alongside strong lead investors
- Deploy Dow capabilities and resources where appropriate to add value to our portfolio companies

Strategically diversify

- Prefer to keep cumulative investment below $25 million in any single company
- Able to exceed that amount when the investment case is sufficiently attractive
Dow Venture Capital Investment Team

Mike Rehberg  
U.S.A

Kevin McElgunn  
U.S.A.

Mark Felix  
Europe & Israel
Dow Venture Capital Target Sectors

While Dow participates and innovates across a wide range of industries, there are targeted sectors in which Dow Venture Capital is most active.

**Water**
Leader in water purification & specialty separation technologies:
- FILMTEC™ Reverse Osmosis Modules
- DOW™ Ultrafiltration Modules
- DOWEX™ / AMBER™ Ion Exchange Resins

Representative Areas of Interest:
- Reducing total cost of water purification
- Enhancing membrane efficiency in separations
- Selective materials (molecules & solids) extraction

**Electronics**
Leader in electronic materials technologies:
- Chemical mechanical polishing (CMP) of semiconductor wafers (pads and slurries)
- Metallization electrochemistry
- Photoresists and Antireflective Coatings

Representative Areas of Interest:
- OLED and related materials enabling flexible formats
- Films & materials that enhance or enable displays
- Advanced packaging & metalorganics materials

**Agriculture**
Leader in crop protection & seed technologies:
- Broad portfolio of herbicides, insecticides, fumigants & fungicides, and nitrogen management products
- Seeds include corn, soybean, sunflowers, canola, cotton, alfalfa

Representative Areas of Interest:
- Traits for improved yield and nutritional value
- Enabling biotechnology
- Improvements in performance and sustainability of crop protection products

**Packaging**
Leader in packaging technologies:
- Polymers for food, hygiene, consumer packaging and pipes.
- Laminating adhesives
- Photovoltaic encapsulation and protection materials

Representative Areas of Interest:
- Driving packaging from rigid to flexible structures
- Polymers or materials that enhance barrier, protection, or functionality of the package or its contents.
Dow Venture Capital Target Sectors (cont’d)

**Construction / Infrastructure**

Leader in energy efficiency materials and construction chemicals:
- STYROFOAM™ Brand Insulation
- GREAT STUFF™ Insulating Foam Sealants

Representative Areas of Interest:
- Material enhancement chemicals
- Green building materials.
- Advanced adhesives and sealants

**Transportation**

Leader in energy management foams, advanced adhesives and composite materials:
- BETAFOAM™ acoustical and structural foam
- BETAMATE™ adhesives

Representative Areas of Interest:
- New light weighting materials
- Functional fluids
- Advanced electronic materials

**Energy**

Leader in upstream, refinery and transport chemicals:
- AMINE MANAGEMENT℠ program for gas treating
- TERRAFORCE™ technology for hydraulic fracturing
- NEPTUNE™ advanced subsea flow assurance

Representative Areas of Interest:
- EOR Solutions
- New additives for enhance well performance and efficiency
- Pipe protection and performance chemicals
- Improved sustainability energy materials and chemicals

**Home and Personal Care**

Leader in home product and personal care additives and chemicals:
- METHOCEL™ rheology modifiers
- EcoSmooth™ sensory enhancers

Representative Areas of Interest:
- Bio-based ingredients
- Biodegradable alternatives
- Application or delivery materials
In Summary

- Dow Corporate Venturing employs research and commercial capabilities to support a comprehensive approach to opportunity identification, business modeling and build-out.
- We are looking for opportunities, trends and strategic connections with emerging technology organizations.
- We continuously evaluate emerging opportunities in a cross-business setting on a global basis.
- Connecting with Dow presents opportunity – with resources like global reach, channel access, and proven scale-up, technology, science, marketing, and commercialization expertise – for accelerated exploration.
Making innovation move …