

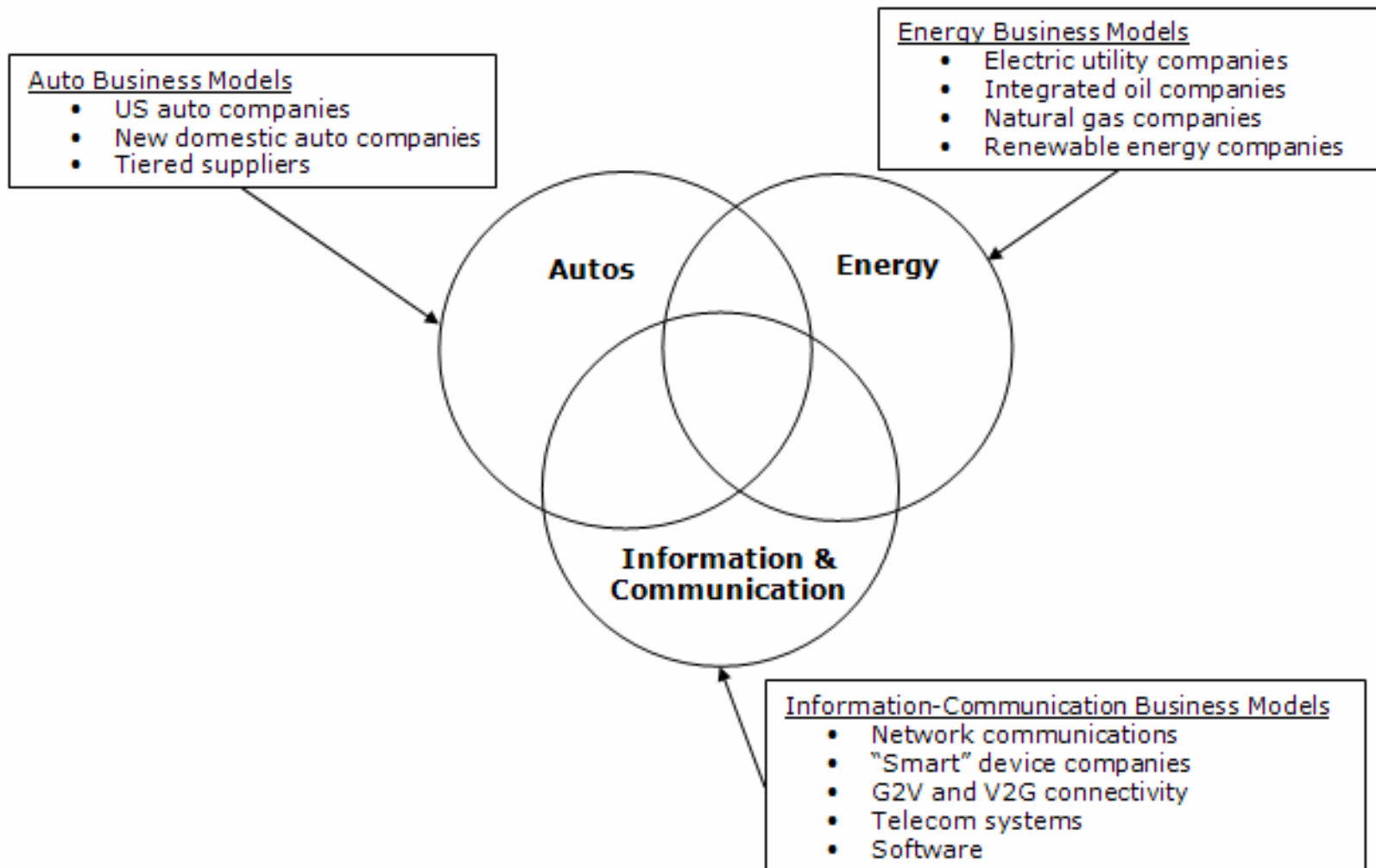
Network Innovation for Sustainable Mobility: Connecting the Auto Industry and Entrepreneurs

**MEETING OF THE
NATIONAL HYDROGEN AND FUEL CELLS CODES AND
STANDARDS COORDINATING COMMITTEE**

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Convergence and Opportunity

Entrepreneurship for Sustainable Mobility



Logic of Network Innovation

1. Significant business opportunities at intersection
 - Only partially captured by traditional business models
2. Entrepreneurs and independent innovators active
 - Technology opportunities
 - Market insight
3. Purpose of network innovation
 - Connect auto OEM and suppliers with entrepreneurs
 - Innovation process: faster, better, cheaper
 - Create competitive advantage for participants

R & D Alone Is No Longer Enough

- R&D remains necessary
 - You have to own a team
- Open-source network can expand opportunities for R&D to contribute
- R&D and competitive success:
 - Microsoft, 2006: R&D 14.9% of sales
 - Apple, 2006: R&D 3.7% of sales

“Open innovation is more about increasing R&D options than about replacing existing ones. The external technological collaboration is complementary to internal R&D investments”

What is Network Innovation?

- Open Innovation Process
 - Part of the solution
 - Well suited to pre-competitive model, USCAR
- First observed in IT markets
 - Linux...began as counter-culture movement
 - Open Source Development Lab (OSDL) funded by:
 - IBM, Oracle, Intel, HP through Linux Foundation
 - Maintaining independence important to “deal flow”

Open Innovation Business Model: Examples

- Merck
 - Merck Gene Index: public listing of genetic markers found in university research
 - Objective: prevent patenting by entrepreneurs
 - Capture value in downstream activities
- Proctor and Gamble
 - Vertically integrated innovation model not working – 2000
 - Too expensive and slow

Open Innovation Business Model: Examples Continued

- Proctor and Gamble
 - For every P&G researcher, 200 outside company
 - R&D innovation model
- collect and develop innovation model (C&D)
- Establish global network of entrepreneurs and innovators
 - Half of new product developments have external components
 - One-company network innovation

Innovation Network for Sustainable Mobility (INSuM)

Clemson University Project

- Department of Energy grant
 - Original: design and validate network innovation center for H₂ transition
 - Now: for automotive transition
- Phase 1: through September 2009
 - Business model for NIC
 - Set of working partners:
 - USCAR
 - Edison Electric Institute and EPRI
 - Automotive Research Alliance (ARA)

Innovation Network for Sustainable Mobility (INSuM)

Clemson University Project

- Phase 2: through September 2010
 - Business plan for NIC
 - Final set of partners
 - Operating “experiments” to validate concepts
- End of Phase 2 decision:
 - Go forward on private funds or not?

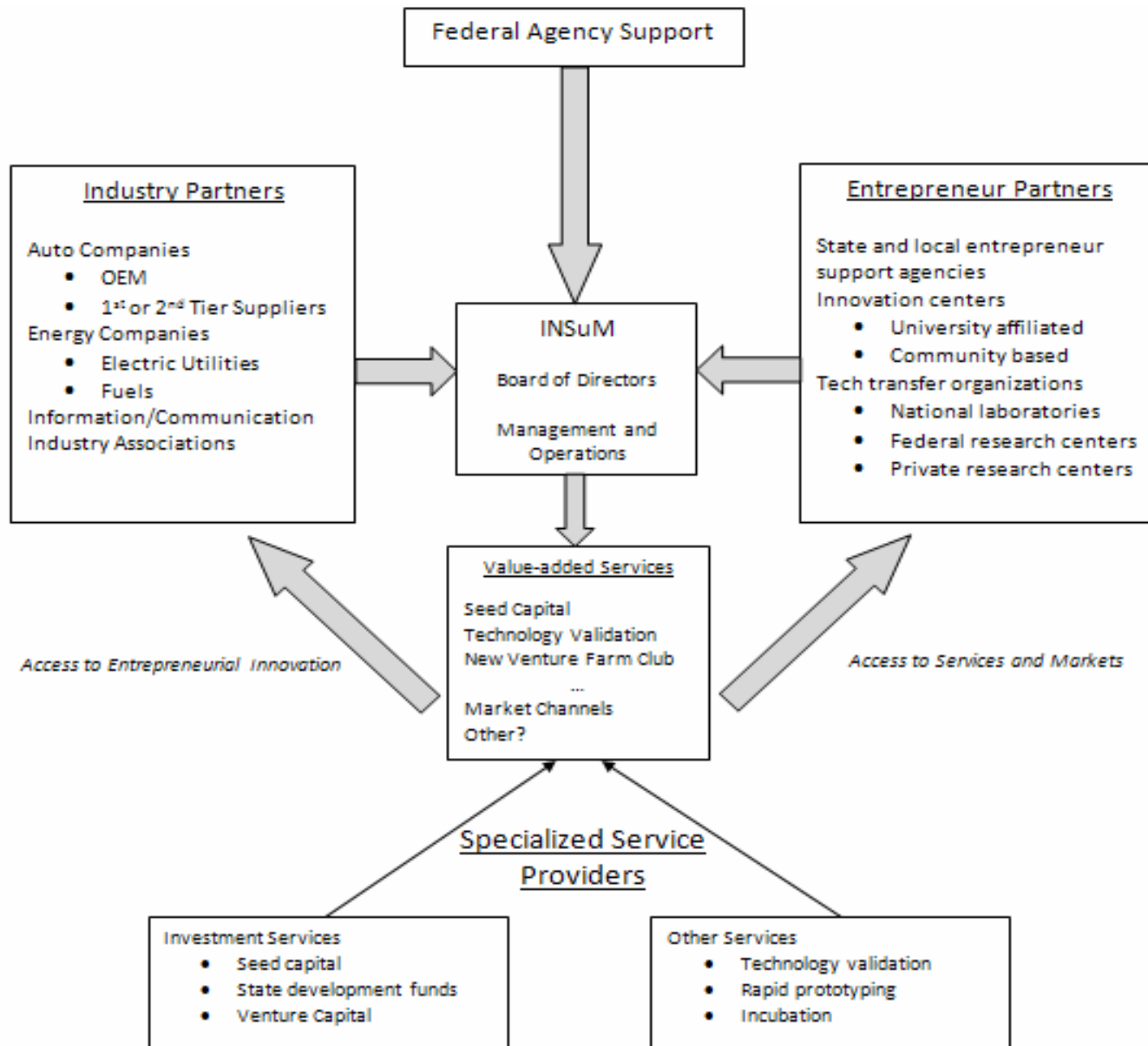
What INSuM Can Deliver

- Innovation process that is faster, better, cheaper than:
 - Vertically integrated alone
 - Vertically integrated + large supplier
- Job creation through success of new ventures
- Accelerated transition to sustainable mobility

How it Can Deliver

- Create better “impedance match” between:
 - Auto industry
 - Other relevant industries
 - Electric utilities
 - Fuels companies
 - Entrepreneurs and innovators worldwide
- INSuM offers entrepreneurs:
 - Improved channels to market
 - Systems integration
 - Value-added services
 - Access to capital

Structure and Operations



Codes and Standards Needed

- No systems integration without C&S
- KEY QUESTION:
 - *Can INSuM serve as a bridge between the codes and standards community and the entrepreneurial community?*
- How can this best be done?
 - Entrepreneur feedback to codes and standards writing
 - Communicating codes and standards widely