Opportunity Abounds...

1) Connected health
2) Environment and energy
3) Smart cities
4) Agriculture and environment
Model for Connected Health

Diagnostics
- OLED display
- Sensors
- Biosensors

Monitor and Diagnose
- Data Analysis

Disposition via the Supply Chain
- Data Storage
European Commission
Strategic Energy Technologies (SET) Plan

• For 2020: 20% reduction of CO2 emissions, a 20% share of energy from low-carbon energy sources and 20% reduction in the use of primary energy by improving energy efficiency.

• For 2050, the SET-Plan is targeted at limiting climate change to a global temperature rise of no more than 2°C, in particular by matching the vision to reduce EU greenhouse gas emissions by 80 - 95%.

• Global roadmaps showing the key milestones of each EEI – European Industrial Initiatives.
Joint Programming Initiative - Urban Europe

This website has been created to provide access to information on JPI Urban Europe and create transparency about JPI Urban Europe. It is a temporary website that will be further developed and extended.

Progress

24-10 & 25-10-2011: JPI Urban Europe in Copenhagen

On the 24th and 25th of October, Governing Board members of JPI Urban Europe met in Copenhagen. During this meeting members proposed and discussed a new organizational structure for the JPI Urban Europe Management Board as well as the implementation ...

About JPI - Urban Europe

What is JPI Urban Europe?

Urban Europe is a new Joint Programming Initiative (JPI) with affiliated European countries: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Malta, The Netherlands, Norway, Spain, Sweden, Switzerland and Turkey.
What are the challenges for agriculture...

Commission Communication ‘The CAP towards 2020’

Reform of the European Common Agricultural Policy by Jan. 1, 2014

Challenges

- Economic challenges
  - Food security
  - Price variability
  - Economic crisis
- Environmental challenges
  - GHG emissions
  - Soil depletion
  - Water/air quality
  - Habitats and biodiversity
- Territorial challenges
  - Vitality of rural areas
  - Diversity of EU agriculture
Mind map for ICT in Agriculture

Pre-cultivation
- Crop selection
- Land selection
- Calendar definition
- Access to credit

Crop cultivation and harvesting
- Land preparation
- Sowing
- Input management
- Water management
- Fertilization
- Pest management

Post harvest
- Marketing
- Transportation
- Packaging
- Food processing

DSS, GIS, MIS, sensor networks, m2m communication

Networking tools (mobile phones, lo-fi technologies) for broadcast
GPS, MIS, sensor networks, m2m communication
Tracing devices, KMS, e/m-learning, e/m-consulting, GPS, GIS
Farm to fork tracing tools – GPS, RFID, GIS, DBMS, MIS, KMS, e/m-learning, e/m-consulting, machine2machine communication

Reference:
Global Forum on Agriculture
www.egfar.org
Compressive Sampling

• Ever increasing volumes of data.
• Very advantageous to be able to sample the data.
• But then we must restore the data.
• If so, we need suppositions on the data. I.e. a model of what our data represents.
• A model of this sort is provided by multiscale transforms – wavelet, curvelet, etc.
• A dictionary of diverse transforms can be used.
Dictionary of multiscale transforms, $\Phi$.
Sensing protocol or schema, $H$.
y is recorded, and $x$ is the true or ideal signal.
y = $H \times x = H \Phi \alpha$
We solve for $\alpha$ such that there is an optimal match with $y$.
We make use of incoherence of $\Phi$ and $H$. 
Data is a form of Energy
(view from data centres perspective)

• “Data is really the next form of energy,” Christian Belady said. “Instead of distributing power, we should think about distributing data. It’s far easier and more efficient to store data than power. I view data as just a more processed form of energy.”

• “...it is easier and more efficient to distribute energy (in the form of data) over fiber than electricity over copper wire,” he said.
(So: Integration is key)

• “In fact, year-over-year we find more ways to put more data through the same fiber. However, we can never figure out how to put more electrons through copper wire. So it only makes sense to combine power generation and datacenter capacity into ‘data plants,’ which will be substantially more efficient for distributing data.”

• ... it will take the integration of everything from the computer chip all the way out to the utility plant before it gets there and will require rethinking and evolving how software, security and applications work together more effectively to support such an IT and industry evolution.
Conclusions

• “Policy pull” and social problems/issues, with consequent opportunity.

• New methodology – in data analytics, signal processing, computer learning, grid computing and the data grid, ...

• Convergence of bits and electrons

• And molecules

• Essential enablers: social, legal, political, ethical
Research Areas

• Massive data streams, context awareness, real time automation.
• Standardization of design, fabrication processes, materials.
• “Virtual engineering”, integration of simulation and design.