Cliff Brereton
Director, Hartree Centre

Being ‘Essential’
E-Infrastructure

- 2011 Tildesley Report
- £160M Investment from BIS
- Economic Impact through Software & Modelling

“To out compute is to out compete”
By Design

ARM, BAE, Bentley, Glaxo Smithkline, Unilever, JLR,
‘Value’

"It costs £500,000 to do each physical test of a car crash, and it's not repeatable. It costs £12 to run a virtual simulation of a car crash, and it’s fully repeatable”
Andy Searle, Head of Computer Aided Engineering, Jaguar Land Rover.

Our customers tell us ‘Value’ is defined as:

• More Sales, More Customers
• Products developed Better, Faster, Cheaper
• = Competitive Advantage
Client Projects include

- Engineering & Manufacturing
  - Vehicle Design & Testing
  - Consumer Electronics Design
  - Consumer Packaged Goods Design
- Environment
  - Weather modelling
- Life Sciences
  - Genomics for better crop yields
- Energy
  - Advanced Battery Cell Design
  - Efficient Well Head Oil extraction
- Financial Services
  - Risk Management
  - Service Modelling
Unilever
Hartree Compute assets

- Blue Joule 98,000 Cores (1.2 Pflops)
- Blue Wonder 20,000 Cores
- 9PB of Disk Storage
- 15 PB of Tape Storage
- 3 Visualisation Walls
- Big Data Analytics Cluster (288TB)
  - At Rest
  - Streaming
- ‘Novel’ server technologies
- STFC / e-Infrastructure South
  - Nvidia Tesla GPU Cluster
Our People

- Engineers
- Chemists
- Life Scientists
- Mathematicians
- Software Developers
- Data Scientists
Hartree Service Offerings

- **Collaborative R&D**
  - Outcome focused projects
    - “Help me make a better…..”
  - Primary cost element is staff

- **Software & Algorithms**
  - New software applications for HPC or Big Data
  - New Algorithms
  - Optimisation of existing codes for new platforms / architectures

- **Training & Skills**
  - Logical course curriculum to broaden and deepen adoption and application of Modeling & Simulation

- **Platform as a Service**
  - Timeshare use of Hartree assets
  - Predominantly self service
  - Primary cost element is machine asset time
  - May or may not include Hartree owned software assets
  - May include some separately costed Hartree staff effort
Hartree Centre and LLNL HPC Innovation Centre

- Agreement signed August, 2013
- Sponsorship from respective Governments.
  - To share & grow ‘know how’ and competitive advantage
    - Industry Focus
    - Technical - Software
    - Emerging technologies – Big Data, Energy Efficient compute, etc
  - To support ‘Anglo-American’ Commercial Client Engagements
- Commitment from a shared industry partner - IBM
Workflow within our Partnership

• Industry Days
• Collaborative workshops
• Joint client projects
  – Engineering
  – Life Sciences
• Client Engagement support
  – Scale and skills
• Technology Exploration
Summing Up

- E-Infrastructure provides better products, faster and cheaper.
  - Competitive advantage and ROI
- Accessing these assets is easy
- Partnerships provide:
  - Access to clients
  - Skills
  - Know how
  - Technologies
  - 1+1=5
Thank you