Disruptive Technologies: Potential Economic Impact in 2025
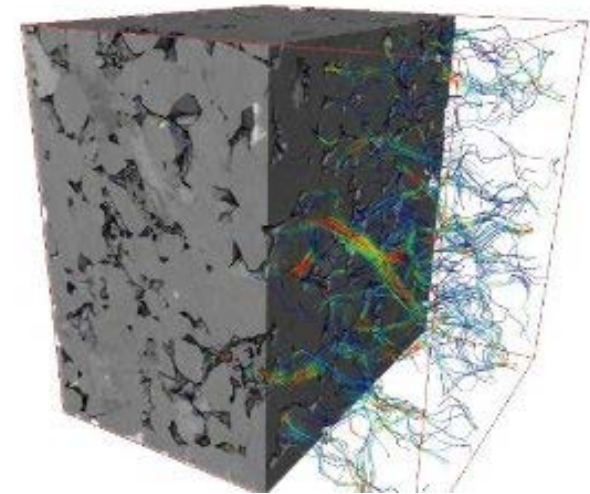
$ trillions, annual

- Automation of Knowledge Work: 5.2-6.7

- Internet of Things: 2.7-6.2

- Cloud Technology: 1.7-6.2

- Advanced Robotics: 1.7-4.5

- Autonomous Vehicles: 0.2-1.9

- Energy Storage and Distribution: 0.1-0.6

- Advanced Oil and Gas Exploration/Recovery: 0.1-0.5
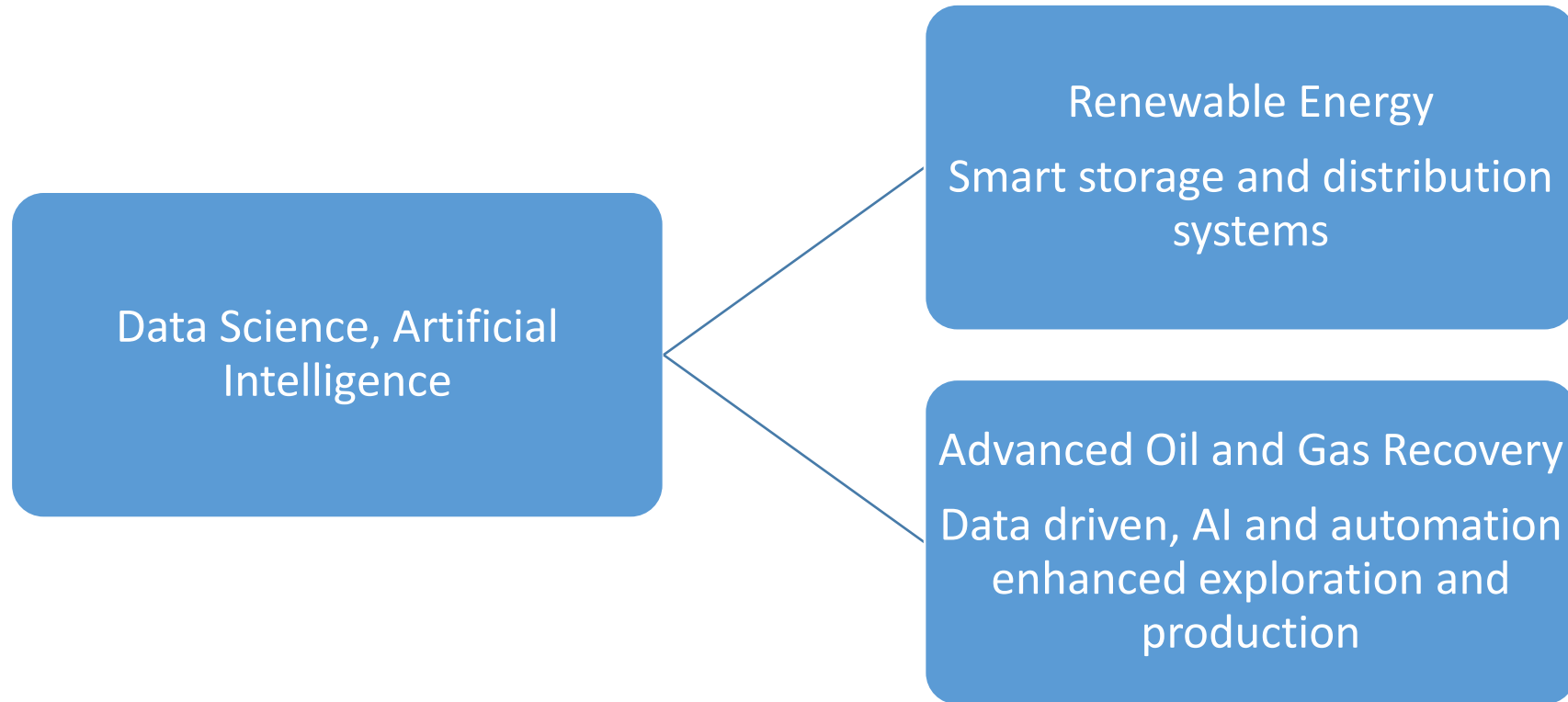
- Renewable Energy: 0.2-0.3

Source: McKinsey Global Institute

UW Investments

- Supercomputing capacity (UW and NCAR)
  - Room for expansion

- Four faculty in Artificial Intelligence/Machine Learning
  - Funding from Uber, NSF, DARPA
  - Deep neural nets, evolutionary AI algorithms, bias in AI systems
  - Robot Learning Laboratory
  - Bolt-on AI minor/certificate

- Cybersecurity Education and Research Center (CEDAR)
  - Professor of Practice lead
  - Searching for 2 cybersecurity hires
  - NSA/DHS program certification

- Campus wide data science cluster hire
  - Data analytics, business analytics, bioinformatics

- Center of Innovation for Flow in Porous Media
  - Data driven oil and gas recovery
  - World-class imaging resources

- Wind Energy Research Center
  - Computational fluid dynamics, predictive analytics
  - Distribution modeling

Tech and tech-enabled initiatives

Data Science, Artificial Intelligence

Renewable Energy

Smart storage and distribution systems

Advanced Oil and Gas Recovery

Data driven, AI and automation enhanced exploration and production

Common infrastructure: Computing

Proposal: Public-private partnership (quasi-private entity) to promote computing related economic development in WY. Core assets: Supercomputer ($6M) plus storage ($2M). Housed in existing facilities (UW IT or NCAR).

Computing support for economic development

- On demand, reserved, or host computing
  - Cloud based
- Priority and discounts given to those locating operations in WY
  - Low income entrepreneurs
  - Economic development in depressed areas
  - Worker retraining, career realignment for older workers
  - Scaled to employment benchmarks
- Unreserved capacity open to out-of-state private entities, academic institution, and government entities at market rates
  - Revenue stream to create in-state seed funding program
  - WY private employers ALWAYS receive priority (not an academic enterprise)
- Benchmark and price comparator: Amazon Elastic Compute Cloud (EC2). https://aws.amazon.com/ec2/

Industry consortia and testbeds

Integration of AI and Data into WY Industry

- Wind Energy R&D Consortium and Testbed
  - Physical industry scale testbed
  - Integration of data analytics and AI into planning and operations. Enabling smart energy distribution and storage systems
  - $1M annual membership with match from state.
  - Consortium companies get exclusive license to technologies developed.
- Rig of the Future Consortium and Testbed
  - Integration of data analytics (including digital rock physics), AI, and automation into exploration and production.
  - Full scale testbed rig for developing and testing new autonomous technologies.
  - $1M annual membership with match from state.
  - Members receive exclusive license.