News release

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Contact:	Mike Davies (on site at Davos), PwC Mobile: +44 7803 974 136 Email: mike.davies@pwc.com Rowena Mearley, PwC, New York Mobile +1 347 501 0931 Email: Rowena.j.mearley@pwc.com
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New analysis identifies game changing technology solutions for climate change

DAVOS, Switzerland, 18h January 2017: New analysis by PwC UK identifies the top ten most influential breakthrough technology solutions that could be combined into five game changing innovations with substantial potential to move towards a zero net emissions economy over time.

Rapid technology and innovation advances underpinning the 'Fourth Industrial Revolution' (4IR), come at a time when scientists report the highest levels of pressure on climatic, water, land and air systems.

Innovation for the Earth demonstrates how ten technological innovations including artificial intelligence (AI), blockchain, robots, Internet of Things (IoT), cloud technology and advanced materials could come together to provide innovative and commercial viable climate solutions.

The study applies the potentially most influential technology solutions to five areas of focus for the reduction of greenhouse gas emissions; clean power, smart transport systems, sustainable production and consumption, sustainable land use, smart cities and homes.

It showcases how innovators and businesses could harness these advances to build solutions that deliver sustainability benefits, alongside economic and societal impacts. Addressing some of climate change's biggest challenges could be helped by combining the technologies into five innovation game changers:

1. A next generation distributed grid: combining blockchain, Artificial Intelligence (AI), the Internet of Things (IoT), cloud and big data, and advanced materials.
2. Electrification of the transport system: combining cloud and big data, advanced materials, AI and IoT.
3. A smart and automated road transport grid: combining autonomous vehicles, cloud and big data, and IoT.
4. Smart and transparent land-use management: combining autonomous vehicles, IoT, AI, cloud and big data.
5. Technology enabled urban planning and design: combining IoT, AI, cloud and big data, advanced materials, 3D printing, and autonomous vehicles.

Examples outlined in the report include virtual power plants connected to each other via the cloud, and utilising the IoT to aggregate emerging energy sources including solar panels, micro-grids and energy storage installations, could be optimised using big data and machine learning.

Dr Celine Herweijer, partner, sustainability & climate change, PwC comments:

> "The challenge for investors, innovators and governments is not just to help unlock technology breakthroughs for challenges like climate change, but to mainstream the environmental and social impact considerations into wider technological advances. This means the positive impacts on people and the planet can be maximised."
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> "Companies are still in the early stages of grappling with what the fourth industrial revolution's technological advances means for their business. There are huge opportunities to apply the technologies to real earth challenges today, and in doing so, create commercial advantage."

The study warns that innovators and policy makers also need to plan in the unintended consequences of rapid advances in technology and its accessibility. The expanding digital economy has an exponentially rising need for data transmission, data storage and computing power, giving rise to increasing GHGs and digital waste alongside the energy and emissions savings it generates.

Dr Celine Herweijer, partner, sustainability & climate change, PwC comments:

> "Resource efficiency is not a given of each technology innovation but is a possibility at design. This makes smart and sustainable technology design and performance standards or targets a business and government imperative. Likewise social consequences of emerging technologies need to be carefully addressed. To really succeed in creating sustainable growth that protects the planet and people, technological transformation needs to be a means to deliver responsible growth, not the end-game in itself."

Innovation was ranked as the top business priority to strengthen in the annual PwC CEO survey released this week at Davos.

Notes

1. The top ten fourth industrial revolution technologies with potential for addressing climate change are: 1. Advanced materials; 2. Cloud technology including big data; 3. Autonomous vehicles, including drones; 4. Synthetic biology 5. Virtual and Augmented reality; 6. Artificial intelligence; 7. Robots; 8. Blockchain; 9. 3D printing; 10. Internet of things.
2. The five climate levers identified were clean power; smart transport systems; sustainable production and consumption; sustainable land use; smart cities and homes.
3. The five key emerging Fourth Industrial Revolution game changers for climate change are identified as 1. The next generation distributed grid; 2. Electrification of the transport system; 3.A smart and automated road transport grid; 4. Smart and transparent land-use management; 5. Technology enabled urban planning and design.
4. The 4th Industrial Revolution (4IR) is the phrase used by the World Economic Forum to encompass the explosion in technological innovations characterized by connectivity, speed, breadth and depth of transformation.

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