



## A Collection of Primary Tools



Clean Energy

### Tool – Decentralized micro-grids

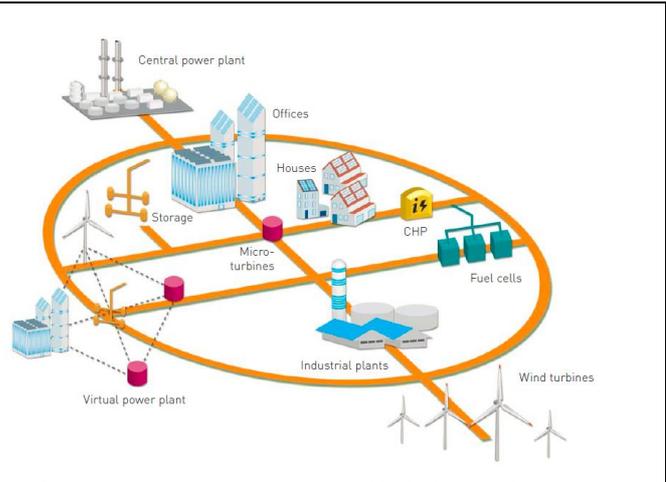
**What this tool does:** This tool will enable local decision makers to initiate the creation of decentralised micro-grids. The renewable energy sector will require micro grids if it wants to grow. This tool explains the importance of micro-grids, and how these can be developed.

*“China has become the world’s largest market for power transmission and distribution (T&D), and is poised to become a major consumer of smart grid technology. Commitments by China’s political leaders to reduce the carbon intensity of its GDP by 40 to 45 % by 2020 relative to 2005, and to increase the use of renewable power promise a massive transformation of the nation’s energy landscape...”* (Xu, D., Wang, M., Wu, C., Chan, K. 2010. Evolution of the Smart Grid in China. McKinsey. [www.mckinsey.com/~media/McKinsey/dotcom/client\\_service/EPNG/PDFs](http://www.mckinsey.com/~media/McKinsey/dotcom/client_service/EPNG/PDFs)).

#### How does this tool work?

<b>SmartGrids: Enhancing grid flexibility and robustness</b>	This applies to grid equipment, metering systems, and control/ automation architectures;
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- Compile tools of **proven technical solutions** that can be deployed rapidly and cost-effectively, enabling existing grids to accept power injections from distributed energy resources without contravening critical operational limits (such as voltage control, switching equipment capability and power flow capacity);
- Establish **interfacing capabilities** that will allow new designs of grid equipment and new automation/control arrangements to be successfully interfaced with existing, traditional, grid equipment;
- Ensure **harmonisation of regulatory and commercial frameworks** in Europe to facilitate cross-border trading of both power and grid services (such as reserve power, for instance Nordic hydropower), ensuring that they will accommodate a wide range of operating situations without creating perverse incentives or other unintended consequences;
- Establish shared technical standards and protocols that will **ensure open access**, enabling the deployment of equipment from any chosen manufacturer without fear of lock-in to proprietary specifications.



*Future: Operation of system will be shared between central and distributed generators. Control of distributed generators could be aggregated to form microgrids or 'virtual' power plants to facilitate their integration both in the physical system and in the market.*

**Smart Grids.** Source: European Commission. 2006. *European Smart Grids. Technology Platform.* Brussels. [http://ec.europa.eu/research/energy/pdf/smartgrids\\_en.pdf](http://ec.europa.eu/research/energy/pdf/smartgrids_en.pdf)

- Develop **information, computing and telecommunication** systems that enable businesses to utilise innovative service arrangements to improve their efficiency and enhance their services to customers.

Further information: Clean Energy – EC-Link Position Paper. [http://eclink.org/media/filer\\_public/c8/b8/c8b8e9be-bfe5-4d5c-839d-087322c79e22/2-ce\\_23-012018.pdf](http://eclink.org/media/filer_public/c8/b8/c8b8e9be-bfe5-4d5c-839d-087322c79e22/2-ce_23-012018.pdf)