



Distributed Generation: Opportunities for Distribution Network Operators, Wider Society and Generators

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Abstract : This study explores and quantifies the benefits of connecting more distributed generation (with and without the use of smart connections) across different parties (Distribution Network Operators, wider society and generators). Different connection scenarios are proposed (with partial and full interruptible capacity quota, a mix of generation and different technology-specific curtailment levels) for integrating DG units in the constrained area of the March grid (East of England). This constitutes the trial area of the Flexible Plug and Play project, which is being implemented by UK Power Networks. The smart connection option is by far the preferred option across all the scenarios (higher NPV/MW). However, for some generators the results are very sensitive to the discount rate used (i.e. solar PV). The analysis of the distribution of benefits suggests that generators capture most of the benefits while DNOs and wider society capture much less benefit. A *smart connection incentive*, which recreates the benefits to DNOs from an earlier losses incentive, is proposed. In contrast with other societally desirable metrics which are usually incentivised or penalised, there is currently no direct connection between more DG MWs connected and DNO incentive payments. Our proposed *smart connection incentive*, by charging DG for smarter connection may help to distribute more efficiently the benefits for connecting more DG.

Keywords distributed generation, renewable energy, smart solutions, cost benefit analysis, smart connection incentive

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