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Combining supply and demand side instruments to stimulate innovation – the case of the ICT sector

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The ability to create technological innovation leading to greater resource efficiency will be a crucial factor in mitigating global environmental pressures and resource needs, as well as in insuring the competitiveness of an economy. The paper explores a policy mix to stimulate such innovation. The information and communication technology (ICT) sector has been chosen as an example for increasingly globalized production and consumption patterns, which result in distributional effects on a global scale and lead to environmental and social pressures mostly in developing states. For example, while consumption of ICT products still happens primarily in industrialized countries, iron ores that are used during the production and that carry high total material requirements (or ecological rucksacks) often are mined developing countries under poor working and environmental conditions. The same is true for the disposal and recycling of a considerable part of ICT waste. So far, attempts to deal with these problems in OECD countries, e.g. under the European WEEE Directive, have often focused on the waste dimension of ICT products and have mostly failed. On the other hand, industry associations are increasingly alarmed about foreseeable shortages of 'strategic materials'. Therefore, the paper explores alternative ways of approaching the issue of transboundary environmental problems, which appear in one place of production, but are caused by consumption in a different place. This spatial divergence offers great potentials for both reductions in environmental impacts, as well as the realization of innovations in technology in that process. Drawing on the main obstacles on the way towards higher resource efficiency through technological innovation, the paper proposes and explores a concrete combination of supply and demand-side instruments: in order to gain information about global material flows and the material input (incl. 'ecological rucksacks') per product, the implementation of information obligations following the 'No Data, No Market' principle will provide the knowledge basis without which neither markets can truly identify shortages nor effective innovation policies can be built. The use of green, innovation-oriented public procurement can incentivize more resource-efficient technologies and help get them through the "valley of death" to marketability. Further, dynamic standards can assure the effective diffusion of innovative technologies in the market and help sustain constant improvements in technology. By combining policy instruments that can foster both disruptive and incremental innovation (innovation-oriented public procurement) and the effective diffusion of marketable technologies into markets (dynamic standards), we provide an approach to both reduce the resource needs of an economy and increase its competitiveness. An example on the basis of a typical supply chain in the ICT-sector will illustrate potentials (and possible limits) and show how the policy mix of both supply- and demand-side instruments would stimulate innovation and contribute to minimizing environmental burdens of consumption while at the same time enhancing resource security in a strategic industry sector.