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Advantages of Sector Coupling to the Sustainable Energy Systems Planning

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Abstract

After the EnergyPLAN and GenOpt have coupled together for the first time, a simulation based optimization has gained popularity in energy planning articles. The advantage of the coupling method is a synergy effect and integration of three different sectors e.g. heat, electricity and transport in comparison to a typical separated method. As a result, different technical measures cannot be applied separately for each individual sector without having impact on other coupled sectors. This impact can be demonstrated as a positive and negative cumulative effect. The cumulative effect from various technical measures applied within national energy system model may be observed only with annual simulations. Therefore, in this work this synergy effect will be explained in greater details for the first time. In this paper a parallel between individual and joined contribution of different policy goals of various technical measures applied to the national energy system model has been drawn. The conclusion aims to show the significance of sector coupling for sustainable energy planning.