Editorial

Introduction to discussion paper on 'Three Frames for Innovation Policy: R&D, Systems of Innovation and Transformative Change'

In the Editorial to the first issue of *Research Policy* (RP) founding editors Chris Freeman and colleagues posited: "The issues confronting policy-makers, whether in government, industry or universities, involve questions of value as well as questions of fact and theory. Critical debate and clash of opinion on policy is both inevitable and desirable, and the Journal will provide a forum for such debate" (Freeman et al. 1971/72, 2).

Following this ambition RP publishes, once in a while, 'discussion papers'. Rather than presenting recent research results discussion papers aim to advance reflection about the underlying *ontologies* and the *direction* of multi-disciplinary innovation studies, policy and management, in particular if "there is, as yet, no consensus (i.e. different researchers may hold quite different views) and a discussion paper with invited responses may help advance the debate in a fruitful manner" (Martin, 2016, 1691). Recent examples include the article by David Mowery et al. (2010) on global climate change and required policy responses, and the discussion paper by Richard Nelson on the epistemological differences of physics compared with other sciences including the social sciences and the consequences for methodological choices (Nelson, 2016).

In the above mentioned first Editorial Freeman and co-editors also wrote: "Increasing social concern with the short and long-term consequences of scientific research and technical innovation has led to a growing need to relate the private decisions of the individual researcher, laboratory or firm to a wider social context in which the full social costs and benefits of an innovation may find expression" (Freeman et al. 1971/72, 1).

This concern with the full social cost and benefits of current and potential future innovation is at the heart of the ongoing debate on the transformation of present-day innovation systems, practices and policy and the need to gear the transformation towards 'Sustainable Development Goals' or 'Grand Societal Challenges' (e.g. Mowery et al., 2010; Foray et al., 2012; Steward, 2012; Weber and Rohracher, 2012; Kuhlmann and Rip, 2018).

In this issue, we publish a discussion paper by Johan Schot and Ed Steinmueller on 'Three Frames for Innovation Policy: R&D, Systems of Innovation and Transformative Change'. The authors claim "that it is time to articulate more forcefully and to experiment in practice with a framing for science, technology and innovation policy that emphasises socio-technical system change." (Schot and Steinmueller, 2018).

We have invited two colleagues to comment on the Discussion Paper. Jan Fagerberg argues "that the existing theorizing and knowledge base in innovation studies may be of great relevance when

designing policies for dealing with climate change and sustainability transitions." (Fagerberg, 2018). Elisa Giuliani suggests "that the current grand challenges are related in a non-trivial way to companies' wrongful business conduct, especially that of large multinational corporations which have grown to rival governments in size, and have demonstrated to be powerful agents capable of shaping the global governance agenda." (Giuliani, 2018). These comments are followed by a final response by Schot and Steinmueller.

The reader will recognize some elements of "critical debate and clash of opinion on policy", as postulated by Freeman and colleagues.

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