Abstract   Deep uncertainties like environmental and socio-economic changes create challenges to decision making. Decision Making under Deep Uncertainty (DMDU) methods are recognised approaches to navigate deep uncertainties and support robust and adaptable decisions. However, their ability to fully reflect the context in which these decisions are made has been criticised. This paper presents a synthesis across cases and methods to provide a holistic understanding of the application of DMDU methods to support long-term decision making. We carried out a structured literature review and analysed 37 infrastructure DMDU case studies. The analysis shows that DMDU methods are effective at developing plans to address a range of deep uncertainties and in some cases, reflecting the institutional context of the decision. However, they largely overlook the organisational and individual contexts in which decision making happens. We argue that the use of existing DMDU methods in practice should start with a better understanding of the institutional, organisational and individual contexts. We then suggest modifications to the applications of DMDU methods, i.e. internalising the context at different stages of the decision-making process and developing a decision typology to signpost decision makers to the best approach for a specific context.