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Reflections on Europe

Policy-driven projects: Empowering the world to confront grand challenges

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ABSTRACT

The world is beset by grand challenges, those messy, multi-stakeholder, value-laden, complex, wicked, and constantly evolving problems like climate change, unsustainable development, economic inequality, and global pandemics. While these grand challenges call for projects to translate policies into actions and changes, these projects tend to fall short of their 'beautiful' goals- such as the United Nations' Sustainable Development Goals (SDGs). Yet, the management literature remains mostly silent about the role of projects and project delivery in tackling grand challenges. In this article, we discuss the contribution of projects to grand challenges and ask what type of project management they demand, particularly in Europe. In light of the sheer complexity and interdependency of grand challenges and the projects they provoke, we call for further collaboration between project scholars and management scholars to help policymakers shape a better world where no one is left behind.

1. Introduction

In a speech in June 2016 in Greece, Jean-Claude Juncker, then president of the European Commission, referred to Europe's interlocked and simultaneous crises, such as the sovereign debt crisis, the surge of migrants and refugees, and Brexit, and warned that the EU might be "sleepwalking from one crisis to another without waking up," only to claim twenty months later in another speech that "we have slowly but surely turned the page from this so-called polycrisis" (Juncker, 2016, 2018). Juncker's crystal ball seems to be wrong.

Indeed, Europe is bedevilled by a seemingly intractable polycrisis of an environmental, geopolitical, social and economic nature, such as the climate change and biodiversity puzzle, the Russian invasion of Ukraine, Brexit and far rights movements, inflation, an ageing population, global pandemics, and the refugee crisis (Tooze, 2021; Wilson, 2023). As the Financial Times, which selected the term 'polycrisis' as one of its buzzwords in 2022, notes: "In the wake of the global dislocations caused by the pandemic and the intensification of the contest between great powers, Juncker's confidence that Europe, or the world for that matter, have put the polycrisis behind them looks sublimely misplaced" (Derbyshire, 2023). While some observers (James, 2023) suggest these crises remind us of 'the revolutionary fight for a new world' that swept Europe in 1848 (Clark, 2023), others are adamant that this 'age of megathreats' is "a new era that will more closely resemble the

tumultuous and dark decades between 1914 and 1945" (Roubini, 2022).

We live in a 'world of grand challenges'. As George et al. (2023, p. 25) note: "The world is beset by social, environment, political, and economic challenges that show no signs of abatement." Indeed, policymakers grapple with grand challenges imperilling our future, such as climate change, unsustainable development, economic inequality, and global pandemics, that is, those messy, wicked, multi-stakeholder, value-laden, complex, uncertainty-prone, and constantly evolving problems the world confronts (Ferraro et al., 2015; George et al., 2016, 2023; Howard-Grenville, 2021). To address grand challenges and hence reimagine a better life for billions of people, policymakers turn to overarching frameworks such as the Paris Climate Agreement, the United Nations' Sustainable Development Goals (SDGs), the European Green Deal, and the European Union's Horizon Europe research and innovation programme. It would appear that they "ought to invest in a fundamentally different post-COVID Europe, rather than restoring Europe to mirror post-COVID times" (Dzurinda, 2020, p. 119). Notably, these grand challenges and the 'mission-oriented' policy responses they elicit (Mazzucato, 2018; Mazzucato & Kattel, 2020) call for a 'reset' of management theory and practice (George et al., 2023; Roth, 2021) and in particular a reconfiguration of project management theory and practice (Ika & Munro, 2022; Locatelli et al., 2023).

Indeed, research suggests that policy-driven projects – the focus of this article – are central to making government promises and objectives

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a reality (Sanderson & Winch, 2017; Söderberg & Liff, 2023). As a UK independent parliamentary body suggests: “Ninety-five per cent of government policies are delivered through major projects” (National Audit Office (NAO), 2013, p. 4). In particular, projects remain instruments of choice for policymakers who seek to “save the world from the damaging threats posed by grand challenges” (Ika & Saint-Macary, 2023, p. 50). However, while projects may help break grand challenges into actionable pieces (Etzion et al., 2017; Ferraro et al., 2015), they often underperform and miss their intended policy goals. For example, midpoint progress reports note that only 12% of the UN SDG targets are on track globally (Pilling, 2023), and one-third of them will not be met by the European Union by 2030 (Lafortune et al., 2024). Yet, as Davies et al. (2023, p. 25) aptly note, policy research offers “surprisingly little guidance on how projects can be designed and coordinated to achieve a societal mission.” Further, the management literature remains mostly silent about the role of projects and project delivery in tackling grand challenges (see Ika & Munro, 2022, 2024; Winch et al., 2021, 2023; Locatelli et al., 2023 for a few exceptions). This is the objective of this article, which focuses on the crucial role of ‘grand challenge projects’ from the public policy perspective and offers a few insights for reconfiguring management theory and practice to match the high complexity of grand challenges.

2. What are grand challenges and what are they not

The term grand challenges is fraught with confusion (Seelos et al., 2023). The term, however, goes back to 1902, when a German mathematician, David Hilbert, formulated 23 problems to solve to advance his field of study (Howard-Grenville, 2021). The Bill & Melinda Gates Foundation also uses the term in this sense in the global health context, echoing its mathematical origin (Varmus et al., 2003). In this article, we do not construe grand challenges as “discrete and tractable problems with a likely straightforward but not-yet-discovered technological solution,” such as how to put a rover on Mars (Ika & Munro, 2022, p. 602). We rather conceptualise them as “formulations of global problems that can be plausibly addressed through coordinated and collaborative effort” or “specific critical barrier(s) that, if removed, would help solve an important societal problem with a high likelihood of global impact through widespread implementation” (George et al., 2016, pp. 1880 and 1881). So, while putting a rover on Mars is an incredibly difficult engineering problem, it has at least a clear goal. Citizens and taxpayers in particular might need to pay for it, but their lives would go on as usual. While dealing with climate change is a far more wicked problem, should we make old, inefficient cars and boilers illegal? Should we build more nuclear reactors? Should we mass-retrofit homes? And who is going to pay for all of this? Who is getting short-term costs and benefits?

In other words, grand challenges are fundamentally *intractable* problems, that is, social, ecological, political, and economic issues that are radical uncertainty-prone, complex if not wicked, and cut across “jurisdictional boundaries, implicating multiple criteria of worth, and revealing new concerns even as they are being tackled” (Ferraro et al., 2015, p. 367). Key examples of grand challenges include addressing the SDGs (UN, 2015), dealing with climate change (Ferraro et al., 2015), and preventing global pandemics (Howard-Grenville, 2021). Not to mention grand challenges such as alleviating relative poverty, increasing social protection, fostering sustainability transitions, dealing with mass migrations, spreading human rights, supporting affordable housing, reducing precarious work and livelihoods, increasing food security, and ensuring effective states, which Europe and the rest of the world are no strangers to (Ika et al., 2020; Ika & Munro, 2022). As Wilson (2023) writes:

“The challenges are simply of too great scale for individual European Union member states – as the chaotically buffeted United Kingdom, having elected to go it alone in a spasm of collective narcissism, shows all too clearly. Indeed, because they are worldwide rather than

European, Europe is also called upon to offer compelling global as well as European solutions.”

In Europe, the term grand challenges did appear in the Lund declaration (Lund, 2009), which inspired the innovative, cross-disciplinary and cross-sectoral 80 billion-euro Horizon 2020 (2014–2020) and the subsequent 95.5 billion-euro Horizon Europe (2021–2027) to remediate grand challenges such as climate change and the SDGs, and boost European Union’s competitiveness and growth (European Union, 2024; Mazzucato, 2018).

Not all grand challenges are equal on the complexity scale. Attributes such as timescale, spatial scale and types of phenomena, locus of solutions, and levels of analysis are necessary to get a sense of their complexity (Seelos et al., 2023). Many of the world’s most intractable puzzles, such as the SDGs, consist of social, ecological or economic problems (George et al., 2023); critical barriers that make it difficult to remediate them (George et al., 2016); ambitious goals (UN, 2015) or societal problems that appear preoccupying for policymakers, though they are yet to occur (Seelos et al., 2023, p. 259). Grand challenges may differ according to their time horizon: While COVID-19, the refugee crisis of 2015 and natural disasters have a short-term horizon with a clear endpoint, sustainable development and climate change, considering their broad goals, have a long-term horizon (Eisenhardt et al., 2016). Grand challenges with local reach, such as unequal access to water in a specific region of the world (Etzion et al., 2017), should be differentiated from grand challenges with a global reach, such as the SDGs (Howard-Grenville, 2021). Locus of solutions may be found at the single individual or organisational level, or they may include collective action and collaboration across multiple stakeholders throughout the world. Scholars may thus investigate grand challenges at the micro level of individuals or groups, the meso level of larger social groupings or regions, or the macro level of countries or the environment (Seelos et al., 2023).

Five features may help distinguish grand challenges from other social or economic problems society confronts (Ferraro et al., 2015; George et al., 2023).

First, grand challenges typically differ from ‘complicated’ problems, where the cause-and-effect relationships between parts of the problem can only be ferreted out by experts (e.g., landing a rover on Mars). In essence, they tend to constitute complex (Ferraro et al., 2015), if not wicked, problems because they hold non-linear, path-dependent, inter-twined and often shifting relationships that are only obvious in retrospect (e.g., climate change adaptation) (Ika & Munro, 2024).

Second, grand challenges typically confront uncertainties or ‘unknown unknowns’, which present unknowable probability distributions, not risks or ‘known unknowns’, which present knowable probability distributions. This radical uncertainty (Ferraro et al., 2015) makes it difficult to identify solutions to fix the problem (Ika & Munro, 2024). For instance, which long-term effects of climate change are ‘unknown unknowns’? The ramifications of increasing global temperatures in terms of impact on ecosystems, cities and communities, food provision, etc., are unknown. Will climate change trigger more global pandemics? How? Where? Which kind?

Third, grand challenges typically involve differing, if not conflicting, expectations between different societal groups of stakeholders (Jarzabkowski et al., 2019), causing evaluative concerns as there is no single set of criteria upon which these groups can strike a consensus on the problem let alone the solution (Ferraro et al., 2015). Addressing grand challenges may often require confronting entrenched interests and inequalities, which can pose an obstacle to progress. The increase in temperature because of climate change might increase farmable land in country X (which historically used to be too cold) while reducing farmable land in country Y.

Fourth, grand challenges may often be global in scale, and hence, they require a holistic problem-solving view that sees beyond the discrete expectations of single individuals, groups, organisations, and

communities (George et al., 2023). In the case of climate change, it is unlikely that a single organisation or country can make a significant reduction in global emissions. Tackling global greenhouse gas emissions needs the commitment of the vast majority of countries and organisations.

Fifth, grand challenges often take years to emerge, and their impacts may reach beyond the present and affect future generations (George et al., 2023). In the case of climate change, the question is, for instance, to what extent does the present generation need to sacrifice its well-being (considering that we are already suffering from the mistakes of previous generations) in order to preserve the well-being of future generations (and future environment)?

The puzzle of the net-zero transition in Europe illustrates these five features.

- 1 – Complex, wicked problems: As of today, the European Union, which includes 27 member states, accounts for only 6.7% of the global annual greenhouse gas (GHG) emissions, a percentage that has been declining for many years (Europe Union, 2023a). Therefore, a frequent narrative is that whatever Europe is doing is irrelevant, i. e., “it is useless to ask for sacrifices from European citizens if, e.g., China or India doesn’t change”. Yet, considering the historical cumulative emissions, this percentage jumps to around 17% (Statista.Com, 2024). According to the World Bank, the average yearly carbon emission is 5.5. tons/person in the EU 27, against a global average of 4.3 (World Bank, 2023).
- 2 – Unknown unknowns. Climate change is already happening. Yet, the implications for the European environment and society are hard to know. The discussion spans from doomism (“we will all die!”) to defeatism (“climate change is almost irrelevant in the EU!”). The narrative around this latter perspective is that while it is true that, e. g., there might be an increment of natural disasters (e.g., floodings from rivers), the number of people dying from them is almost irrelevant with respect to, for example, the number of people dying because of ‘regular pollution’. For instance, according to the European Environmental Agency, “Air pollution is the greatest single environmental health risk in the EU. In 2020, exposure to concentrations of fine particulate matter above the 2021 World Health Organization guideline level resulted in 238,000 premature deaths in the EU-27” (European Union, 2022). Yet, while we are all familiar with the risk of pollution as we have dealt with it since the Industrial Revolution, the long-term consequences of climate change in the EU are fraught with unknown unknowns, at least for the vast majority of EU citizens.
- 3 – Conflicting expectations from different societal groups of stakeholders. Europe is facing increasing economic inequalities. For example, younger generations struggle to access full-time permanent jobs while an ageing population increasingly struggles to access quality healthcare. Immigration is another topic often discussed and perceived in particular by the poorest of the European citizens since they are competing for low-paid jobs and social housing. So, if on one side, there is growing interest in the younger and more educated generation, the net-zero transition is seen as not urgent or secondary from the other, if not even a threat, because it will impose extra costs, e.g., changing an old car or the boiler of the house. While the wealthiest part of the EU population regularly changes their cars to have the latest fashionable model, and the cost of a new boiler is a fraction of their annual saving, these costs might be prohibitive for a working class which increasingly struggles with low salaries and an increasing cost of living.
- 4 – Global in scale. With the de-industrialisation of Europe and the closure of coal plants, the transportation sector is increasing its relative share in terms of GHG emissions. This sector is a significant contributor to GHG emissions in the EU27 (European Union, 2019). There is, therefore, a major discussion about electric vehicles. While diesel or petrol vehicles emit GHG emissions mostly from their

operation and, therefore, in Europe, a consistent share of electric vehicle emissions is related to batteries and the extraction, outside Europe, of the materials required to fabricate them.

- 5 – Long time horizons. The growing poverty level in Europe is also affecting the older generations, who, in some cases, struggle with low pensions, cannot find new jobs if they lose their occupation, and confront increasing healthcare costs. Political narratives targeting those generations are focused on satisfying their needs or creating irrational fears (e.g., through rhetoric on immigration, for instance). The Brexit referendum in the UK is a clear example of how voting patterns (and willingness to vote) change across generations (Moore, 2016). So, paradoxically, while the oldest EU generation is the one that historically is accountable for the greatest share of GHG emissions, it is also the generation less concerned with the net-zero transition (Skeiryte et al., 2022).

Therefore, the puzzle of the net-zero transition in Europe gives an indication of the heightened managerial challenge that grand challenges pose for policymakers.

3. Grand challenges elicit policy responses

Typically, grand challenges elicit responses in the form of policy frameworks such as the SDGs, which seek to deal with the world’s most intractable puzzles, such as climate change and income inequality, and ensure no one is left behind by 2030 – the so-called UN 2030 Agenda. Examples of SDGs include combating poverty all over the world (SDG 1), delivering gender equality (SDG 5), creating resilient infrastructure (SDG 9), reducing inequality (SDG 10), and fighting climate change (SDG 13) (UN, 2015).

The European Union, for its part, under the leadership of Commission President Ursula von der Leyen, set forth six overarching ‘headline ambitions’ to foster the transformations required to meet the SDGs and their 169 targets: a European Green Deal; an economy that works for people; a Europe fit for the digital age; promoting the European way of life; a stronger Europe in the world; and a new push for European democracy. These priorities are clearly connected with the five Ps – People, Planet, Prosperity, Peace, Partnership – of the preamble of the EU 2030 Agenda (European Union 2023).

As they scramble to mount a response to grand challenges, policymakers may turn to the Sustainability Imperative or the Responsible Research and Innovation (RRI) agenda or both (Mazzucato & Kattel, 2020). The RRI agenda consists of “a framework that evaluates innovations for their potential harmful consequences, on one hand, and their potential positive contribution to societal challenges, on the other” (Voegtlin et al., 2022, p. 2). In contrast, the Sustainability Imperative is operationalised by policymakers through the ideal of sustainable development, which is put into practice through the SDGs (UN, 2015).

Clearly, tractable problems and intractable problems elicit different policy responses. While classical ‘mission-oriented’ policy frameworks, which are typically of a technological (e.g., nuclear), mono-sectoral (e.g., energy), and economic growth-led (e.g., competitiveness) nature may help deal with tractable problems, ‘challenge-driven’, socio-economic, cross-sectoral, policy frameworks may better suit grand challenges such as the SDGs (Robinson & Mazzucato, 2019). For example, Mazzucato and Kattel (2020) note that SDG 14, “Conserve and sustainably use the oceans, seas and marine resources for sustainable development,” may call for a challenge-driven policy such as ‘A plastic-free ocean’.

In contrast to old forms of missions, which tend to enact authoritative solutions (e.g., essential rules and directives in the case of Chloro-fluorocarbon and ozone hole) or competitive solutions (e.g., market-based competition), these newer challenge-driven missions call for collaborative solutions considering their high complexity, uncertainty and value-laden nature (Roberts, 2000) and even require what some authors term ‘collaborative rationality’ (Innes & Booher, 2015). In other words, the linear, means-to-ends rationality of authoritative and

competitive solutions is ill-suited to deal with the complexity and wickedness of grand challenges, which involve multiple centres of expertise, legitimacy and authority (previously thought of as ‘project managers’, ‘stakeholders’ and ‘beneficiaries’) to communicate and collaborate, redefining means and ends as grand challenges evolve (Ika & Munro, 2024). For example, confronted with the worst global pandemic since 1918, policymakers responded by engaging in an unprecedented collaboration between the public and private sectors throughout the world. This was the case of the US Operation Warp Speed and the UK Vaccine Task Force, which were established as partnerships between government departments and global vaccine companies such as Pfizer/BioNTech and Oxford/AstraZeneca (Ika & Munro, 2022; Winch et al., 2021).

4. Grand challenges call for projects, but what are they anyway, and what features do they share in common?

In this article, we construe a project as “a temporary and singular effort to deliver value to stakeholders or give a specific competitive advantage or relevance to the organisation that is driving it.” (Ika & Saint-Macary, 2023, p. 113). In this sense, the Apple iTunes development project and NASA Apollo moon landing project are innovation projects, although the former is funded and led by the private sector and the latter by the public sector (Davies et al., 2023). Other projects, however, are policy-driven projects and thus constitute fundamental building blocks for policy implementation worldwide (Sanderson & Winch, 2017). For example, the Cohesion Policy of the European Union, which seeks to achieve conservative policy goals such as infrastructure delivery and deliver innovative policy goals such as the transformative capacity development of regional actors, provides a good example. In Finland alone, between 2007 and 2013, not less than 18,000 projects were designed (Munck af Rosenschöld, 2019; European Union, 2023c).

Policy initiatives require swift public-private sector collaboration or public-private partnerships to deliver (George et al., 2023). Thus, they call for complementary policy-driven projects from both the perspective of the public sector (e.g., develop a market framework to promote X) and business projects from the perspective of the private sector (e.g., develop a new product to do Y or build power plants of type Z) (Ika & Munro, 2022). In particular, transformative policy initiatives or innovative missions such as the European Green Deal cannot reach their targets if a number of government agencies and for-profit companies, as well as different external stakeholder groups, do not work together to devise and enact workable solutions to societal problems. However, in contrast to business projects typical of the project management literature, these policy-driven projects often target ideological change as they seek “to change the mindset of actors within the host organisation in a bottom-up process, rather than implementing a policy by decree in a top-down process” (Söderberg & Liff, 2023, p. 1). We reiterate that our focus rests on policy-driven projects in this article, not business projects.

Challenge-driven policies thus call for projects to translate grand challenges into smaller chunks of ‘doable problems’. Notably, the Paris Agreement’s target of limiting global temperature rise to 1.5 °C above pre-industrial levels and the UN’s SDG 1 of ending extreme ‘poverty in all its forms everywhere’ by 2030 call for projects to transition to lower GHG emissions while still fighting poverty (Ika et al., 2020; Ika & Munro, 2024; Winch et al., 2023).

Other examples include COVID-19 vaccine development projects such as Pfizer & BioNTech’s, candidate vaccines within portfolios such as the US Operation Warp Speed and the UK Vaccine Task Force, and interventions in the form of programs such as mass vaccination campaigns across countries (Ika & Munro, 2022; Winch et al., 2021). Other projects are part of regional frameworks such as the EU 2030 Agenda or global frameworks such as the SDGs (UN, 2015). For example, the European Green Deal framework involves several projects which seek to make Europe the world’s first climate-neutral continent by 2050 and, hence contribute to SDG 13 (European Union, 2023b). As Davies et al.

(2023, p. 4) write, “many innovative projects are underway and urgently needed to solve some of the most pressing problems and grand challenges of our time, such as designing the zero-carbon, energy-efficient infrastructure or developing vaccines at a rapid pace to prevent the next global pandemic.” We call these initiatives ‘grand challenge projects’, that is, financially and temporally delimited interventions that seek to contribute to the imperative of sustainability or responsible research and innovation (Ika & Dror, 2024).

The grand challenges literature appreciates the importance of projects. For example, Mazzucato and Kattel (2020) suggest the challenge-driven SDG 14 policy of a ‘plastic-free ocean’ needs research and innovation in developing new methods of reducing plastic pollution, for instance, which necessitates the delivery of projects. Likewise, George et al. (2023) speak of ‘impact projects’ and provide fitting examples of such projects as forms of organising for grand challenges. However, it remains unclear what these projects entail and how they are managed and organised (Ika & Munro, 2022; Winch et al., 2023).

As we distinguish between old forms of mission-oriented policies and newer forms of challenge-driven policies, we also distinguish between moonshot (e.g., NASA’s Apollo moon landing)/bet-the-company (e.g., Apple’s iTunes) projects and grand challenge projects. While the former confront tractable problems and hurdles of mainly a technical and organisational nature, the latter tend to exhibit higher levels of complexity. Indeed, they constitute ‘interventions in both present situations and uncertain futures’ (Whyte & Mottee, 2022; Ika & Dror, 2024). Hence, grand challenge projects may involve initiatives “towards problematising future situations that are likely to occur but do not (yet) constitute social problems, such as concerns about how to prepare for an ageing workforce” (Seelos et al., 2023, p. 259).

We take grand challenge projects to be fundamentally multi-owner ‘fuzzy’ projects (Ika & Munro, 2022), which resist to simple, easy, and narrow solutions by a single organisation due to their wickedness (Davies et al., 2023). Put differently, they target elusive or evolving goals, involve multiple stakeholders with changing or conflicting expectations, and operate in socio-politically complex delivery contexts (Ika & Saint-Macary, 2023). Expressed in another way:

“... it is the greater intangibility of their end goal along with the higher sociopolitical complexity of their surrounding contexts that sets apart grand challenge projects from “great” projects so common in the business sector.” (Ika & Munro, 2022, p. 606)

This fuzziness makes it difficult for stakeholders to devise solutions while their understanding of the problem and its nature continues to shift. Grand challenge projects are not single-owner endeavours that would solve a problem once and for all, as the classical definition of a project would have it. This is a key difference with complicated projects: putting a man on the moon was an incredibly difficult technical challenge, but a single organisation, NASA, was the owner of it. Yes, hundreds of different other organisations collaborated, providing design, components, etc., but they were following directives cascaded down from NASA (Davies et al., 2023). Yet, if we take any SDG, we cannot point to a single “owner organisation” that will give directives to a network of other organisations. Thus, tackling a grand challenge project is akin to a Sisyphean struggle where one strives to solve intractable problems, which in turn create other intractable problems.

Therefore, grand challenge projects require experimentation (Robinson & Mazzucato, 2019) or even ‘distributed experimentation’, that is, “iterative action that generates small wins, promotes evolutionary learning, and increases engagement while allowing unsuccessful efforts to be abandoned” (Ferraro et al., 2015, p. 376).

One size does not fit all grand challenge projects. For example, grand challenge projects differ much on their goal complexity scale. While clean air or absolute poverty reduction projects may have static and absolute goals, the SDGs may have dynamic and relative goals. In the same vein, while COVID-19 vaccine development projects may be considered complicated, mass vaccination campaigns may be complex.

However, apart from a few exceptions (cf. some net-zero projects below), grand challenge projects may be differentiated from non-grand challenge projects that are typical of the project management literature (e.g., regular infrastructure projects such as building a primary school and new standard product development projects such as a new more ergonomic computer keyboard in Italy). Indeed, they share a few characteristics in common, as [Ika and Munro \(2022\)](#) suggest.

- 1) Grand challenge projects tend to be multi-organisation, multi-stakeholder, multi-sector, multi-country, multi-stakeholder, temporary interventions undertaken across the world to tackle intractable problems, which speaks to their high structural complexity. COVID-19 mass vaccination campaigns, for example, involve many organisations in many countries, including the government and the private sector.
- 2) Grand challenge projects represent complex and multi-layered interventions, not merely by their size but also by their reach and impacts for many organisations, public and private, in many countries; hence, as mentioned, they tend to be part of a portfolio, program, network, national development plan, or a regional if not global framework.
- 3) Grand challenge projects have potential outcomes for the functioning of different organisations and societal groups and the well-being of their beneficiaries both locally and globally, and they tend to focus on the provision of global public goods, which adds to their socio-political complexity.
- 4) Grand challenge projects tend to be highly innovative from a scientific, technological, economic, social, policy, organisational and/or operational perspective. The successful development of COVID-19 vaccines in less than one year was a technological breakthrough that is unprecedented in medical history.
- 5) Grand challenge projects may have long-lasting impacts and far-reaching unintended consequences. For example, the emphasis on COVID-19 vaccination came at the expense of vaccination efforts against other diseases.

5. Grand challenges challenge mainstream project management theory and practice

To reiterate, grand challenge projects are policy-driven projects ([Munck af Rosenschöld, 2019](#)), which are extremely complex brain teasers from a managerial perspective. Indeed, grand challenge projects are confronted with knowledge (e.g., information gaps), valuation (e.g., complexity of impact assessment), communication (e.g., challenge of stakeholder alignment), coordination (e.g., allocation of costs), trust (e.g., dealing with opportunistic behaviour), access and reach (e.g., access to disenfranchised and vulnerable groups), and institutional problems (e.g., structures which increase inequality) ([George et al., 2023](#)).

As we have seen in the context of COVID-19 response projects, grand challenge projects fall short of their target goals due to three main problem areas that are often inter-twined ([Ika & Munro, 2022](#)).

- (1) Structural, including political, economic, physical/geographic, sociocultural, historic, demographic, and environmental difficulties (e.g., the EU was confronted with political tensions between ‘vaccine producers’ at the time the pandemic hit and those countries who just had to pay for it).
- (2) Institutional including collusion/corruption, capacity building, lack of political support, too much political interference, governance, and principal-agent problems (e.g., Vaccine approvals in the EU meant interactions with 27 different health ministries compared to only one in the USA, for example).
- (3) Managerial including initiation, planning, implementation, and monitoring and evaluation problems (e.g., supply chain issues meant that Pfizer had to scale back production targets at times,

thereby delaying vaccine delivery to desperate governments all over the world).

Therefore, grand challenge projects require new approaches to managing and organising, including enacting different governance architectures (e.g., provision of public service with private actors) and organisational forms (e.g., lease, operation, and maintenance contracts) and mediating tensions in public-private collaborations ([George et al., 2023](#)).

However, as noted earlier, grand challenges put a strain on the mainstream theory and practice of project management ([Ika & Munro, 2022](#)). We hasten to note that there are two competing notions of projects in the project management literature: a narrow view where projects are conceptualised as ‘deliberate leaps into a planned future’ and a broad view where they are considered as ‘processes of pursuit, experimentation, and discovery’. Grand challenge projects typically do not follow the precepts of the mainstream, narrow, and linear view, which assumes that we collectively know how to deliver projects successfully and that we just need ‘to plan the work and work the plan’ to achieve success. As they are core agents of change and innovation required to remediate grand challenges, grand challenge projects tend to espouse the broader view where we cannot know in advance how ‘to be successful in projects’, and thus we need to learn, exercise agency, and use practical judgment under uncertainty ([Kreiner, 2020](#); [Locatelli et al., 2023](#)).

This is the case of the MountResilience project, which seeks to strengthen the resilience and adaptive capacity of the Catalonia mountain region, learning from the experience of six other European mountain regions, such as Canton Valais in Switzerland, and thus contributing to the EU mission, Adaptation to Climate Change ([MountResilience, 2024](#)). Due to their heightened complexity and wickedness, such grand challenges projects contrast with moonshots such as the Apollo projects (e.g., moon landing), which are innovation projects that were managed in ‘a closed system’ by government agencies. As [Davies et al. \(2023, pp. 25–26\)](#) argue: “Developing climate-change solutions to tackle the open, emergent and pervasive extent of global warming, by contrast, will require “multiple moonshots” that are decentralized and systemic in nature to reflect the complexity of the challenge ... Whereas the Manhattan and Apollo projects did not require broad market adoption, climate change innovations will require extensive, often disruptive changes in consumer behaviour and incentives to induce widespread adoption.” [Table 1](#) contrasts grand challenge projects with moonshot or bet-the-company projects.

As we have mentioned, there are exceptions, however. Some projects, such as strengthening dikes to guard against flooding or delivering energy-saving technologies, may fit the narrow view ([Munck af Rosenschöld, 2019](#)). Additionally, others, such as net-zero projects, may blur the distinction between the two competing notions of projects. Remarkably, while, as vectors of change, projects play a key role in the net-zero transition, *per se*, they cannot be ‘net-zero’ since they require inputs (e.g., material, labour, energy, etc.) with a carbon intensity. However, projects can contribute by changing actual assets. A good example is a wind farm building program to displace coal power plants and contribute toward net-zero goals by changing power electricity generation assets. Interestingly, in the context of the net-zero transition, investigating these projects individually is not scientifically so relevant. For instance, the construction of a wind farm and the retrofitting of a building, when considered in isolation, are conventional projects that can be planned and executed with mainstream project management tools and techniques. Yet, we can do countless other examples of projects reducing GHG emissions by changing socio-technical systems. This observation leads to not trivial questions, such as: Is it possible to identify a few mechanisms of impact of such projects on socio-technical systems? What’s the role of the government? Is it better to invest in a few megaprojects (e.g., building nuclear power plants) or many small, scalable projects (e.g., house retrofitting)? What’s the role of R&D

Table 1

Contrasting grand challenge projects and moonshot projects (Adapted from Robinson & Mazzucato, 2019; Ika & Munro, 2024).

Policies	Projects	Problem nature	Risk/uncertainty	Rationality	Policy responses	Managerial practices	Value nature
Old forms of missions	Moonshot or bet-the-company	Complicated	Risk: Known unknowns	Linear, means-to-ends	Authoritative and/or Competitive	Best practices	Economic
Grand-challenge driven	Grand Challenge	Complex	Uncertainty: Unknown unknowns	Collaborative	Collaborative	“Best-Fit” practices	Socioecological

projects (e.g., developing new photovoltaic technology) that are not decarbonising *per se* but are building the knowledge that other projects will use for decarbonising? (Terenzi, Locatelli, & Winch, 2024).

These discussions at the European level are incredibly complex. Let’s take nuclear power plant projects as an example. The inclusion of nuclear power in the EU’s green taxonomy has been a contentious issue (Rankin, 2023). France, with its nuclear industry, is a strong advocate for nuclear energy and sees it as a low-carbon way to produce electricity and achieve climate goals. Countries like Germany and Austria, however, are opposed to nuclear and are more focused on transitioning to renewable energy sources. The European Commission included nuclear in the taxonomy under specific conditions, such as safe waste management plans. This was a compromise to encourage investment in both nuclear and renewable energy sources for a faster net-zero transition. This decision has sparked debate. Proponents argue it is a pragmatic approach to reach climate change reduction targets quickly. Opponents argue it undermines the green credentials of the taxonomy and distracts from developing truly net-zero solutions. Therefore, these socio-technical transition projects are best conceptualised as processes of pursuit, experimentation, and discovery.

Extant literature on managing grand challenge projects is limited but insightful (Davies et al., 2023; Ika & Munro, 2022). As we learn, “a more probing, creative, front-end oriented approach” may help tackle the grand challenge of climate change (Morris, 2017). Strategic agility and ‘selectionism’ (putting several teams at work and letting them devise different solutions and picking the best one), not ‘instructionism’ (using detailed project planning and risk management), were instrumental in dealing with the complexity and uncertainty that confront COVID-19 response projects (Winch et al., 2021). A ‘system of systems’, multi-project or program approach focused on benefits realisation and multi-level governance may help better understand the interconnections between the SDGs (Sankaran et al., 2020). Such a multi-level perspective to grand challenges is important to gain insight into interactions that occur at the microlevel (e.g., project), the meso level (e.g., portfolio, program, and network), and the macro level (e.g., country, region, world) (Ika & Munro, 2024; Seelos et al., 2023).

In particular, grand challenges – which focus on long-term, socio-ecological success in the face of conflicting expectations from many societal groups of stakeholders - and mainstream project management literature – which emphasises short-term, economic success for a single project sponsor - are in the first analysis strange bedfellows fraught with temporal tensions (Ika & Munro, 2022, 2024). Such a socio-economic value (Robinson & Mazzucato, 2019) must not only be created but shared among nonmarket stakeholders (e.g., beneficiaries, citizens, communities) and the public at large. This means that grand challenges may have complicated behaviour and thus deviate systematically from their assigned plans (Ika & Saint-Macary, 2023). Thus, mainstream project management (as described in textbooks), with its linear, best practices, and probability-based logic, may not cope with the peculiarities of grand challenge projects as we cannot know in advance some of the relevant probabilities when making decisions. Policymakers thus need emergent practices that are ‘best fit’ to problems, contexts, and organisations, and the collaborative responses they provoke. Thus, ‘strategic logic’, heuristics (rules of thumb), intuition, and agile experimentation may help (see Table 1).

Surprisingly, however, we know little about how projects can

contribute to tackling grand challenges, what project management approaches work, which ones do not work, and why (for a few exceptions, see Lenfle & Söderlund, 2022; Locatelli et al., 2023 in the broader management literature and Ika & Munro, 2022; Winch et al., 2023 in the more specialised project management literature). Also, most likely, what works for grand challenge X in context Y might not work elsewhere in context Z. Research is thus needed to assess how to organise grand challenge projects, elucidate best-fit practices, understand how to efficiently create and fairly distribute value among societal groups, and model grand challenge project behaviour (Ika & Munro, 2022, 2024). However, research on grand challenges should not relegate projects to the mere role of a unit of analysis or a setting for data collection (e.g., Lenfle & Söderlund, 2022). Therefore, since grand challenges call for collaboration between groups of stakeholders to achieve their goals (George et al., 2023) and foster ownership and resilience, enabling communities to build capacity and adapt to future challenges, they also call for further collaboration between project scholars and management scholars to move forward with research. As Locatelli et al. (2023, p. 11) write:

“These projects are hard work, difficult to manage and highly uncertain and complex. They are powerful for making futures – which can either be sustainable or not – and thus, it is urgent that projects, organisations and management scholars join forces to understand how projects can address grand challenges. We need more research on projects, and due to the complexity of projects and grand challenges, we need cross-disciplinary work to help practitioners around the globe to shape a better future.”

6. Conclusions

Grand challenges are some of the most pressing problems of our time. As we learn from the revolutionary crisis in 1848 in Europe (Clark, 2023, p. 342), “all governments face insoluble problems – that is what government is for. It is in the nature of political problems that they cannot be ‘solved’”. While grand challenges cannot be solved once and for all, another lesson that policymakers should take away from history is that “the effect of 1848 was to shift the debate from questions of ends (what to do) to questions of means (how to do it)” (James, 2023). It is indeed when it comes to the ‘how to do it’ conundrum that project management matters. We believe that project management can help tackle grand challenges although they make unlikely intellectual bedfellows.

Indeed, grand challenge projects represent a powerful means of conceptualising pressing global issues and, at the same time, advancing the well-being of humanity. By harnessing innovation, collaboration, and collective action, these projects (and the project management theories that support their delivery) offer transformative solutions that have the potential to shape the future of our world. These projects can tackle complex issues that have eluded conventional solutions, often requiring multidisciplinary approaches and significant resources. Whether it is developing renewable energy technologies to confront climate change or implementing inclusive education programs in underserved communities, grand challenge projects aim to catalyse transformative change that benefits society as a whole. While the road ahead may be challenging, the promise of positive change and a more equitable and sustainable future makes the pursuit of grand challenges a

worthy endeavour for societies worldwide.

This is why, in this article, we have reflected on the contribution of projects to grand challenges and asked what type of project management they demand, particularly in Europe. In light of the sheer complexity of grand challenges and the projects they provoke, we suggest research should focus on how to organise grand challenge projects, shed light on ‘best-fit’ practices, examine value creation and distribution, and model grand challenge project behaviour. Finally, to this end, we call for further collaboration between project scholars and management scholars to help policymakers shape a better world where no one is left behind in Europe and across the globe.

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CRedit authorship contribution statement

Lavagnon A. Ika: Writing – review & editing, Writing – original draft, Conceptualization. **Giorgio Locatelli:** Writing – review & editing, Writing – original draft. **Nathalie Drouin:** Writing – review & editing, Writing – original draft.

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