MEGAPROJECT Cross-Case Themes: An Initial Examination

INTRODUCTION

The aim of this document is to stimulate the consideration of cross-case emergent themes from the MEGAPROJECT case portfolio. It does that by:

- Considering the emergent themes that arise from existing literature in this area
- Providing tentative themes that have arisen from the work of the Energy Working Group

It is hoped that MEGAPROJECT Action members will be able to use these initial themes to:

- to confirm whether or not evidence can be found to support them in their own cases
- to generate ideas about new cross-case themes that can be developed within the Action

Please note that this document is in no way attempting to restrict the identification of themes either in terms of theme or sector!

THEMES IN EXISTING LITERATURE

Big Empirical Studies

Despite the proliferation of research on megaprojects, very few studies have attempted to bring together large bodies of empirical data on which to make their conclusions. Three studies that stand out in this respect are:


Cases comprise 318 projects in 77 organisations from the oil, gas, mining, power and chemical sectors


Cases comprise 270 projects (though these were not all strictly ‘megaprojects’ by the MEGAPROJECT definition) road and rail transport projects


Cases comprise 60 projects from the power generation, transport and water sectors.
The following themes are supported by or postulated from the empirical evidence gathered by the above studies:

- Megaprojects perform very badly in terms of adherence to delivery schedule and budget
- Poor performance is due to ‘optimism bias’ in both initial estimates of the need for the megaprojects (e.g. forecasting transport flows) and in predicting the time and resource needed to complete the project.
- Poor performance is a result of not spending enough time and resource in the ‘front-end’ of the project before the detailed planning and construction begin.
- Poor performance is due to the lack of competency of project sponsors who fail to ‘shape’ an appropriate business case and configuration for the megaproject at the start of its lifecycle.
- Poor performance is due to an inability to effectively resource the project during the planning and construction part of its lifecycle.
- Poor performance is due to the choice of an inappropriate governance structure for the megaproject (though opinions differ on what an appropriate contractual structure would be)
- Poor performance is due to turbulence in the external environment for which inadequate risk provision has been made.
- Poor performance is due to an incorrect team configuration
- Performance in megaproject provision is improved by transparency in the decision making process
- Performance in megaproject provision is improved by the use of ‘reference class forecasting.’

Other studies

There is a significant amount of other literature relating to megaprojects which tends to be based on a limited empirical dataset (e.g. a single illustrative case). Emerging themes from this type of literature are presented below. (N.B this is NOT exhaustive and is indicative only):

- Contractual frameworks matter to megaproject performance(Yakovenko 2004; Anderson Jr, Douglass et al. 2006)
- Organizational culture matters to megaproject performance(Van Marrewijk 2007)
- Systems engineering techniques (such as hierarchical decomposition) can assist in project managing megaprojects(Fiori and Kovaka 2005; Davies, Gann et al. 2009)
- Governance impacts on megaproject performance(Haynes 1999; Miller and Hobbs 2005)
- Information flow impacts on megaproject performance(A Bishop and B Gembey 1985; Eweje, Turner et al. 2012)
- Novel forms of financial relationships may improve megaproject performance (Garvin 2007; Veenswijk, Van Marrewijk et al. 2010; Little 2011)
- Megaprojects are often constructed for centralised client agencies and do not deliver benefits to the wider society(Sovacool and Bulan 2011)

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References given at end of document
Megaprojects benefit from better ‘fuzzy’ decision-making processes (Mojtahedi, Mousavi et al. 2008)
Viewing as a megaproject improves the implementation of integrated urban and transport development (Hale 2010)
Megaprojects are usefully viewed as societal conflicts (Jia, Yang et al. 2011; Novy and Peters 2012)
Reducing complexity aids megaproject performance (Giezen 2012)

THEMES EMERGING FROM THE ENERGY WORKING GROUP

Cases Portfolio from which the themes were derived

The emergent themes presented in this document are based on the cases discussed at the last Energy Working Group held in Milano on 27th February 2012. The cases used for this discussion at this stage are as follows (N.B a number of further cases have now been added):

<table>
<thead>
<tr>
<th>Energy Working Group Megaproject Case</th>
<th>Identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flamanville New Build Nuclear Power Plant, France</td>
<td>F</td>
</tr>
<tr>
<td>Adriatic LNG Re-gasification Plant, Italy</td>
<td>A</td>
</tr>
<tr>
<td>Greater Gabbard Offshore Wind Farm, UK</td>
<td>G</td>
</tr>
<tr>
<td>Hinkley Point New Build Nuclear Power Plant, UK</td>
<td>H</td>
</tr>
<tr>
<td>Mochove New Build Nuclear Power Plant, The Slovak Republic</td>
<td>M</td>
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<tr>
<td>EON Datteln</td>
<td>D</td>
</tr>
</tbody>
</table>

Emergent themes (either in terms of tentative hypotheses or in terms of common patterns) from these discussions are presented below. The cases from which the themes are derived are given by the case identifier. An emergent themes was only identified when more than one case exhibited the same characteristics.

Energy Megaproject Heuristics/Hypotheses

- The more unemployment in the megaproject’s local environments, the less resistance to it from local residents. (H, M)
- The dispersion of different social classes in a location of implementation impacts upon the social acceptance process. (i.e. The ‘higher’ the social class of local residents, the more opposition the projects faces. (H, D)
- The more local residents perceive property values to increase/decrease, the less/more resistance to the megaproject. (D, H)
- The more spending by the megaproject on the local community/ the more the local community experiences direct benefits such as a bridge built connecting towns hitherto
disconnected, or the renovation of public buildings, the less the resistance to the megaproject (A, H, M)

- The more trust the general population has in regulators and licensing authorities, the less opposition to megaprojects (F, H)

- The successful completion of a megaproject requires a specific articulation of national government support (M, H, G)

- The more ‘mega’ the megaproject, the more difficult to identify the stakeholders and the more likely for the stakeholders and their needs to change during the lifecycle of the megaproject (M, H, A, M, G, F)

- The more innovative the megaproject, the more likely to fail to meet iron triangle success criteria (supporting proposition G, F not supporting proposition A)

- The more experienced a project manager the more successful the implementation (in terms of duration of the project) is. (M, F)

- The historical experience of end-users/end-stakeholders of the project (inhabitants) with similar projects and or with the contractor, both on the national level and on the local level impacts the social acceptance or lack thereof. (F, H)

**Commonalities Across Energy Megaprojects**

- *Formation of project based organisations (H, G, A, M?)*

There is frequently a joint venture organisation (often an equity joint venture) formed between organisations to be the client/owner for the megaproject. The degree to which this is a ‘real’ organisation (staffed with people and with project management responsibility) or a ‘ghost’ organisation (not staffed with the project activities still being undertaken by the owners varies.

- *Financing of Megaprojects (H, G, A, M)*

Most megaprojects are financed by consortia of organisations and not by a single organisation.

- *Similar Patterns of Actors (H, G, A, F, M, D)*

Energy Megaprojects in Europe have a similar pattern of stakeholder actors and those actors are often act in the same capacity across a number of cases:

- Owners (either directly or of temporary project organisation): Trans-European Energy Companies with a substantive state ownership, e.g. E-ON, RWE, EDF, ENEL

- Prime contractors: Turbo-machinery (Siemens, Rolls-Royce, Alstom); Nuclear Steam Systems (Arreva); EPC (Aker, Fluor, AMEC, Saipem
N.B This is true only in Europe. Other parts of the world will have similar patterns of actors but different actors in them e.g. Samsung, Hyundai

- **Optimism Bias (G, H, F, A?)**

Energy Megaprojects do demonstrate optimism bias in the forecasts of leadtime and costs for completion but the reason for this is not clear. (It does not seem to be for reasons of misrepresentation to create a business case c.f. Flyvbjerg)

- **Lack of Scope Changes (G,H, A,F,D?)**

Energy megaprojects don’t seem subject to scope creep (e.g. target for MWe seems to remain the same throughout the project) This may be something to do with the clarity of purpose. Energy megaprojects are often simply about generating electricity and do not have the complexity of objectives such as cultural events of the Olympics or even iconic transport projects. And they might be connected to policy targets and as such have a binding MWe target. And of course the selection of most important technologies involves often proven and consolidated technology that sets the MWe target and cannot be altered easily.

- **Similarities in Scale (G,H,A,F)**

Energy megaprojects in Europe seem to be of a similar scale. They take about 10 years from the first project idea to full operation. They involve a peak of 3000-5000 person months/years? in construction. They cost €2bn-€7bn.

NJB

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