

## Special submission: Business Presentation – Copernicos Group

### Using system dynamics to improve integrated Life Cycle Cost of Physical Assets

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**Abstract.** *Owners of physical industrial assets often make ineffective Asset Management decisions which may lead to lower returns on investments. This presentation takes a business oriented approach and looks at a practical case in which improvements can be made by using System Dynamics to assess the dynamic behavior of the physical asset and the interactions with the environment. We discuss the case of a large investment company which has experiences in the capital-intensive industry.*

*We observe that facilitating group model sessions and workshops focused on experiencing behavior contributes to collaborative behavior between different organizational disciplines and stakeholders. System dynamics proves to be a useful tool to create shared vision and understanding of the integrated business processes that ultimately leads to higher returns on investments and a better control on risks.*

**Keywords:** Asset Management, System Dynamics, Business Strategy, Risk Management

#### Presentation Overview

Over-capacity and low return on investment is a common problem in the capital-intensive industries in the Western world (Komonen et. al, 2005). Evidence can be found in national newspapers that point out the overcapacity in the energy sector and oil industry (Algemeen Dagblad, 2013; Financial Times, 2013). Frequently, global economic changes are blamed. The typical response of the capital-intensive industry is to cut back on operating cost and to increase higher turnover (Komonen et. al, 2005). Translated to the level of physical assets this means a continuous assessment on the performance of physical assets and tools to control the life cycle

costs. One of these tools currently applied in the industry is Asset Management (ISO 55001:2014; van der Lei et. al, 2012).

This approach transforms traditional maintenance and operations strategy to a more integrated approach which involves multiple organizational disciplines and stakeholders.

However, industries and public organizations that are trying to implement these structures experience several organizational barriers to successfully implement this new method. First of all, life cycle approaches and asset management tools are often implemented and applied in fragmented sections of businesses. Consequently, sub-optimization of industrial processes are reached. Secondly, to change the organizational culture often proves to be a major challenge. To illustrate Industrial business and public organizations often find themselves in a reactive mode to solve chronic failure modes of physical assets.

This business presentation discusses the case of a large international investment company. This company has global experience in investments into renewable energy projects. The majority of its client are large public retirement institutions that have predominantly a long-term perspective. This company takes a proactive approach in life cycle management which results that investors can sustain their return on investments and prolong the life span of physical assets.

This presentation will argue that there is potential benefits for the industry to apply System Dynamics to improve portfolio management of large capital intensive projects.

Finally, some business tools that are used to tackle problem issues and explore opportunities that can be pursued by businesses will be discussed. For example, how System Dynamics can assist in intensive brainstorming sessions between stakeholders to activate a collective learning environment. Also, how workshops can create a shared vision on how to improve best life cycle practice within the business. Especially, when a workshop is supported by the use of an interactive game based on both System Dynamics and Asset Management principles.

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