WORKSHOP – INTELLIGENT DATA

STRATEGIC PLANNING FOR CAMPUS ENERGY INFRASTRUCTURE-

PERNILLE M OVERBYE, RAMBOLL

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AGENDA

1. Setting the scene
2. Data collection
3. Data Handling
4. Sheridan college as a practical example
5. Questions?

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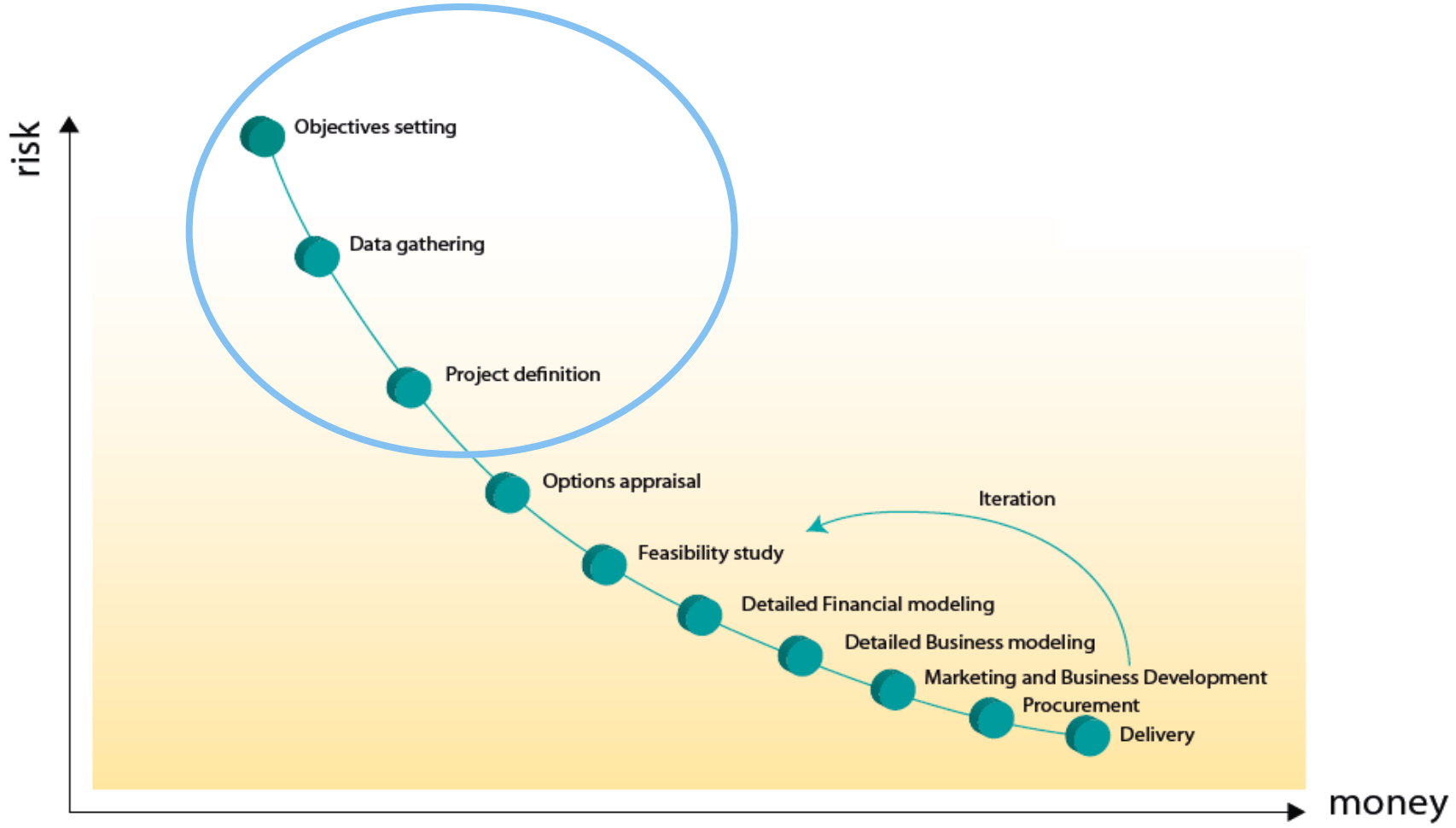
PROJECT PATH



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WHAT IS A GOOD AND EFFICIENT DISTRICT ENERGY SYSTEM ?

METHODOLOGY FOR (DISTRICT) ENERGY PLANNING

DATA COLLECTION

- Heat demand, tenure, ownership, location, current heat and electricity supply;
- Develop energy demand map and database of the opportunity area; and
- Develop supply map, categorise each supply asset.

STRATEGY

- Decide the areas to be connected and the heat supply asset(s) to be used, taking into consideration information from stakeholder engagement and strategic objectives to be adopted (eg. fuel poverty and carbon reduction);
- Determine the modelling scenarios to be tested; and
- Determine the network route required (if applicable).

TECHNOLOGY OPTIONS APPRAISAL

- Develop hourly energy model for the system;
- Assess the low and zero carbon technology supply options for the project; and
- Size key technical assets such as the energy distribution network and supply assets.

ECONOMIC ASSESSMENT

- Determine capital and reinvestment costs for key assets;
- Determine fuel costs and other operational and maintenance costs; and
- Carry out whole life costing of the project opportunity in terms of payback, IRR and NPV.

COMPARATIVE ASSESSMENT OF THE SCENARIOS

- Assessment of each of the modelled scenarios based on the project owners' key drivers; and
- Ranking of the modelled scenarios and recommendations for feasibility assessment.

PROJECT REPORTING

- Report key recommendations;
- Produce high level maps of the proposed opportunity; and
- Set out key risks that need to be addressed at feasibility stage.

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WHAT TO BE AWARE OF – REDUCE RISK

Planning and future proofing

Scale of scheme

Heat density in the supplied area

Rate of connection to the network

Complexity of scheme

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MAIN COMPONENTS IN A DISTRICT ENERGY SCHEME

- Production
  - Pumps
  - Pressurisation system
  - (Thermal storage)
- Pipes
- End-user installations - ETS

PROJECT COSTS, VIABILITY & COST OF HEAT

The cost of installing the heating network depends in summary on four factors:

- The design operating temperature and pressure
- The complexity of existing services and route
- The length of the network
- The peak heat demand

The Cost of Heat is a function of the following parameters:

- Operating and maintenance charges
- Capital required for the installation
- Cost of heat from production

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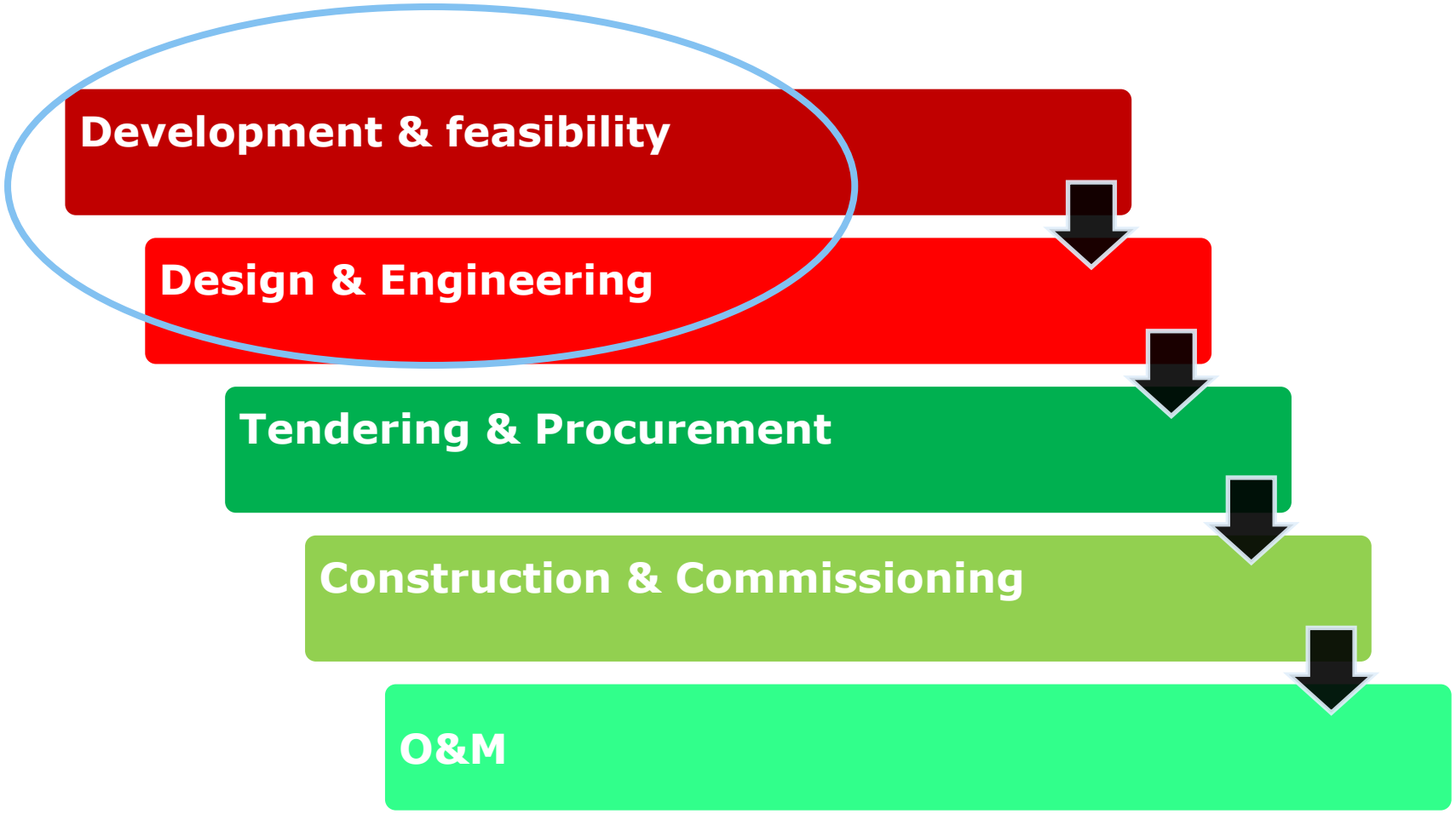
PROJECT PROCESS



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COLLECTION OF DATA, ANALYSIS AND PLAN

DATA COLLECTION

- Priority buildings
- Demands & Loads
- Other services

ANALYSIS

- Focus areas
- Potential – outside areas
- Technical assessment – hydraulic optimisation

IMPLEMENTATION PLAN

- Who is doing what
- What next

METERING

TO METER IS TO KNOW

INFORMATION IS KNOWLEDGE

KNOWLEDGE IS POWER

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GIS

OPTIMISATION WITH GIS (GEOGRAPHIC INFORMATION SYSTEMS)

GIS IS THE NATURAL TOOL TO ENSURE DATA CONTINUITY FROM PROJECT PLAN TO OPERATION AND MAINTENANCE

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DISTRICT ENERGY SYSTEM – SHERIDAN COLLEGE

Challenge

No building demand data

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What they did

Detailed modeling

Installed sub-meters in all buildings

Whart we are doing now

Revisiting all data for sizing of the piped network and plant

https://www.youtube.com/watch?v=wgXkXw27mCY&feature=youtu.be

https://www.sheridancollege.ca/~/media/Files/Sheridan%20College/About/Sustainability/sheridan_iecmpfinalreport_public_v2.pdf

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THANK YOU

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READ MORE ON OUR WEBSITE: WWW.RAMBOLL.COM/ENERGY