APPENDIX B
Guidance for Low Carbon Accountability Mechanisms

Introduction

This document is intended to support the development and implementation of low carbon accountability mechanisms, which are a key element to achieve the goal of an energy efficient and low carbon healthcare facility. The approach to accountability mechanisms should be considered together with the commissioning plan and measurement and verification (M&V) plan.

Overall Approach to Accountability Mechanisms

An overall approach and accountability structure has been developed and refined over the past decade to ensure effective processes, clear deliverables, roles and responsibilities are in place to support achievement of operational targets; however, the approach needs to be customized to the project at hand and the project delivery model.

The key elements of the approach are listed below:

- Targets
- Energy modeling (and energy modeller role)
- Review function, often served by the Independent Energy Consultant (IEC) role
- Measurement and Verification (M&V)
- Reporting requirements
- Financial mechanisms

Ongoing Evolution and Adaptation of Approach

In general, the approach used to date was developed primarily from experience with Acute Care hospitals that were designed and built using a Public Private Partnership (P3) or Design Build (DB) delivery model (see Figure 1). However, the current context of new construction for the healthcare sector in British Columbia includes construction of Long Term Care (LTC) facilities and is favouring other delivery models such as Construction Management (CM) and an Alliance model. An alternative example of how the core approach can be adapted to a Construction Management (CM) delivery model for a LTC facility has been explored (see Figure 2). This will be refined, as we gain experience with Construction Management and Alliance project delivery models.

Figures 1 and 2 provide a visual summary of an overall approach including key roles, tasks, deliverables and financial mechanisms organized by major project phase.

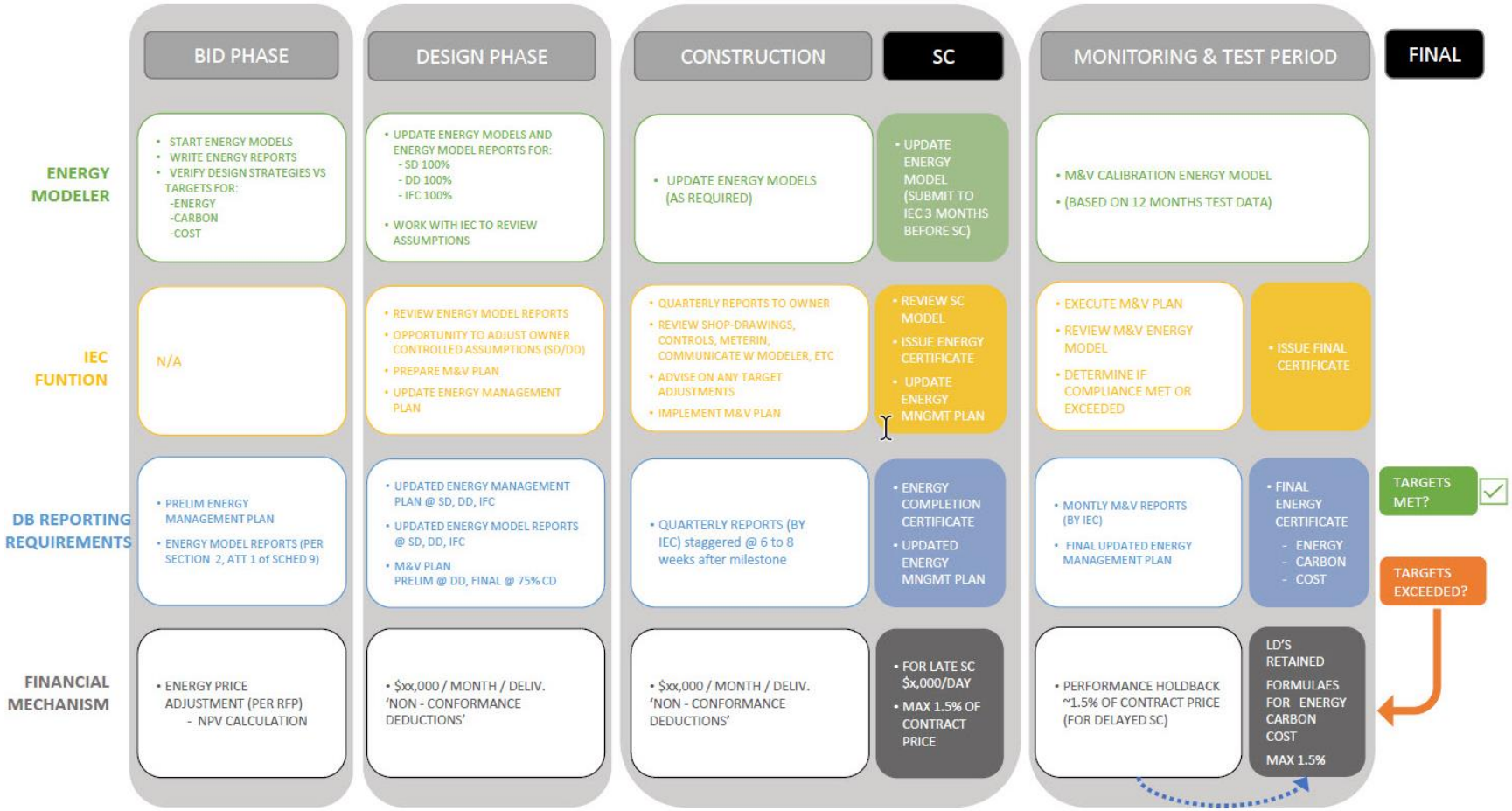

Figure 1: Overview of Accountability Mechanisms Example (Acute Care Facility, DB Delivery Model)

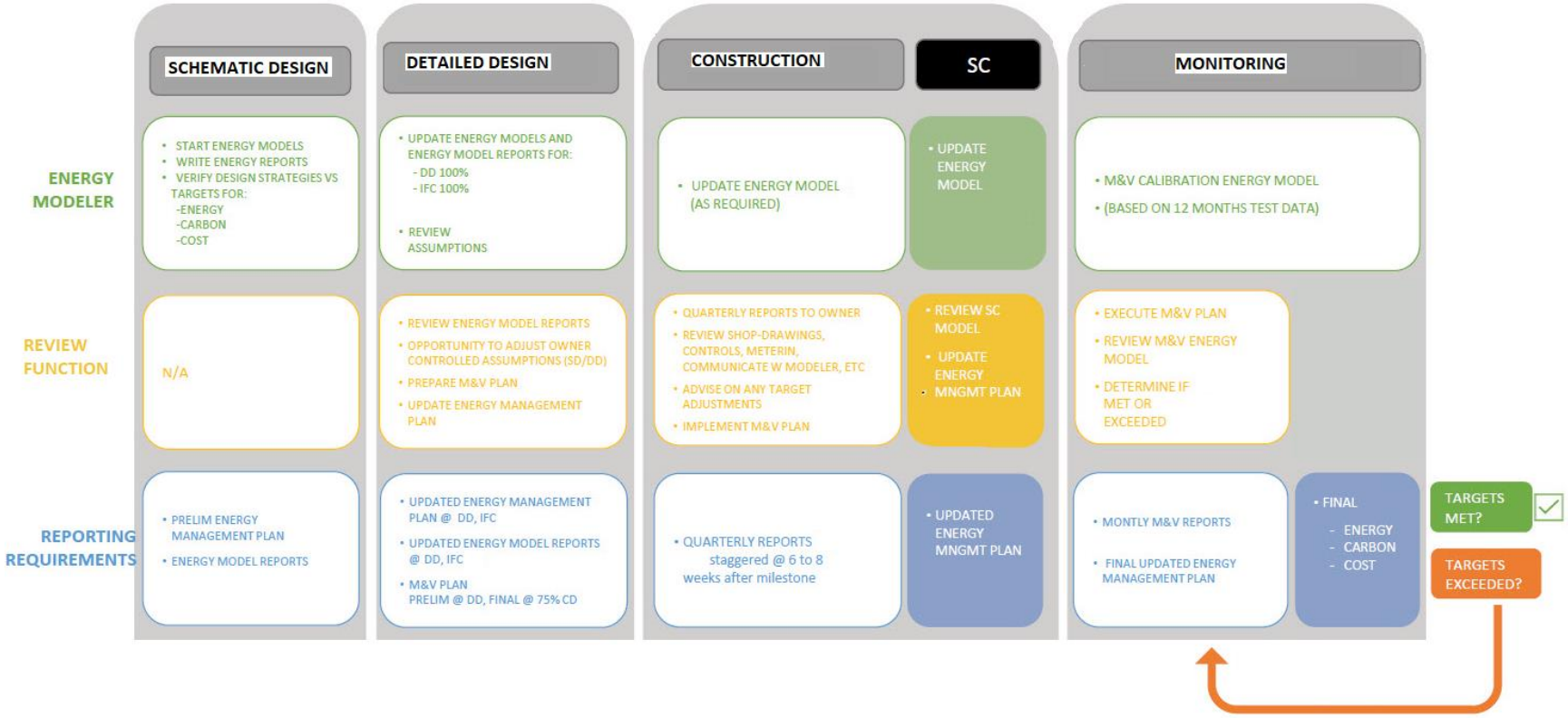

Figure 2: Overview of Accountability Mechanisms Example (Long Term Care Facility, CM Delivery Model)

Key changes between Figure 1 and Figure 2

The key changes between these two examples include the following:

- Review Function performed by Health Authority Energy Manager (instead of Independent Energy Consultant role)
- Somewhat reduced reporting requirements
- Removal of financial mechanisms (assumed to be unnecessary with CM model)
    - If targets are not met, Energy Manager simply continues M&V process in pursuit of desired performance (vs liquidated damages approach)

Objectives & Success Criteria

The objectives of the low carbon accountability mechanisms are to optimize project outcomes including:

1. Minimize **energy** consumption or maximize energy efficiency
2. Minimize **GHG emissions** from the facility operations or maximize carbon reduction
3. Minimize **utility operational costs** or maximize cost efficiency
4. Enable effective **ongoing energy management** including measurement & verification (M&V)

In order to achieve the above outcomes the approach must:

1. **Set clear performance targets** and requirements related to design, construction, commissioning and to some extent operations of energy systems
2. **Incentivize innovation** by encouraging efforts to continue to achieve better performance such as further reducing energy consumption, carbon emissions, and utility costs
3. Encourage a **collaborative relationship** between the health authority and the design & construction teams
4. Require **robust measurement & verification (M&V)** to ensure effective ongoing energy management
5. Create a **consequence for failure** to achieve committed level of energy consumption, carbon emissions, and utility costs (at a minimum the failure is identified using M&V)

Mechanisms to Achieve the Goals

This section provides a high-level overview of key aspects of each of the core mechanisms for achieving the goals, which is intended to provide sufficient guidance to customize the specific mechanisms to the project at hand. For more information, contact the EES representative for the project at hand.

Mechanism	Why	What	How	When
Targets	Establish clarity about the goals and arguably makes possible exemplary performance without necessarily increasing cost when established early in the process.	Specific measurable performance outcomes such as: • Energy: kWh/m2/year or MWh/year • Carbon: kgCO2e/m2/year or Tonnes CO2e/year • Cost: $/m2/year or $/year Targets from Chapter of 11 Capital Policy Manual include definitions in terms of percentage better than LEED Gold, which will eventually need to be translated into more specific targets as above.	Setting targets can be conservative or more aspirational and can done in variety of different ways, including everything from comparison to similar existing buildings to theoretical consideration of what is possible (not necessarily knowing yet how to achieve)	Established as early as possible in the process (ideally within Business Plan)
Energy Modeling	Used to set targets, evaluate options, quantify performance relative to targets, and confirm performance.	Energy modeling used iteratively at various stages of the process with successively more detail and accuracy	Ideally used early in the process to support design decisions	Start using as early as possible in the process (ideally within Business Plan); there may be ways to enable rapid decision-making without building a full
Review Function	Ensure quality of energy modeling	This can be formalized through an Independent Energy Consultant (IEC) role or less formally accomplished by someone with relevant expertise, such as the Health Authority Energy Manager	The frequency and depth of review can be tailored based on the magnitude and risk of the decisions being made.	Some degree of review is required at most major milestones throughout the process (and may require days to weeks for completion after milestone deliverables are available).

Mechanism	Why	What	How	When
Reporting Requirements	Document targets, performance and associated design decisions to provide transparency, support accountability and enable efficient review	The format of reporting may shift as the project progresses from evaluating options to confirming performance; however, some key elements of reporting are always required including clear documentation of inputs, assumptions, results and conclusions.	See Appendix G: Energy Modelling Requirements for more details on what to include.	Reporting on energy modeling is required at all major milestones.
Measurement & Verification	Ensure a holistic and robust approach to energy management that is carried through from design to operations.	A process that connects all of these mechanisms in an integrated way and sets the building up for ongoing energy management	Adhere to Option D (Whole Building Calibrated Simulation) Method 2 of International Performance Measurement and Verification Protocol (IPMVP) Volume III	Start as early as possible in the process.
Financial Mechanisms	Can be used to increase accountability for achieving results	Financial mechanisms may include incentives to drive superior performance, penalties for non-compliance, and holdbacks to ensure completion of scope and deliverables.	These should be carefully tailored to the project at hand to ensure the magnitude of incentive or penalty is in keeping with the value of the desired performance.	Per Figure 1, depending on the project type and delivery model, such mechanisms may be relevant at every stage; whereas other projects may not be well suited for any financial accountability mechanisms (see Figure 2).