

Solar Thermal Energy Generation Protocol

Alberta Protocol Stakeholder Consultations ~ May 2008
Blue Source Canada ULC

Solar Thermal Energy Generation Protocol

- Seed Materials
 - CDM and WRI protocols
 - Alberta Offset System Solar Electricity Generation Protocol
- Technical Review
 - Alberta process with gov't and industry stakeholders

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- **Project Condition**

Where solar thermal energy facilities offset fossil-fuel derived energy through the conversion of solar radiation into useable thermal energy.

- **Baseline Condition**

Where the quantity of thermal energy that would have otherwise been generated using fossil fuel based sources to cover the generation under the project condition.

Dynamic as the amount of thermal energy produced will change.

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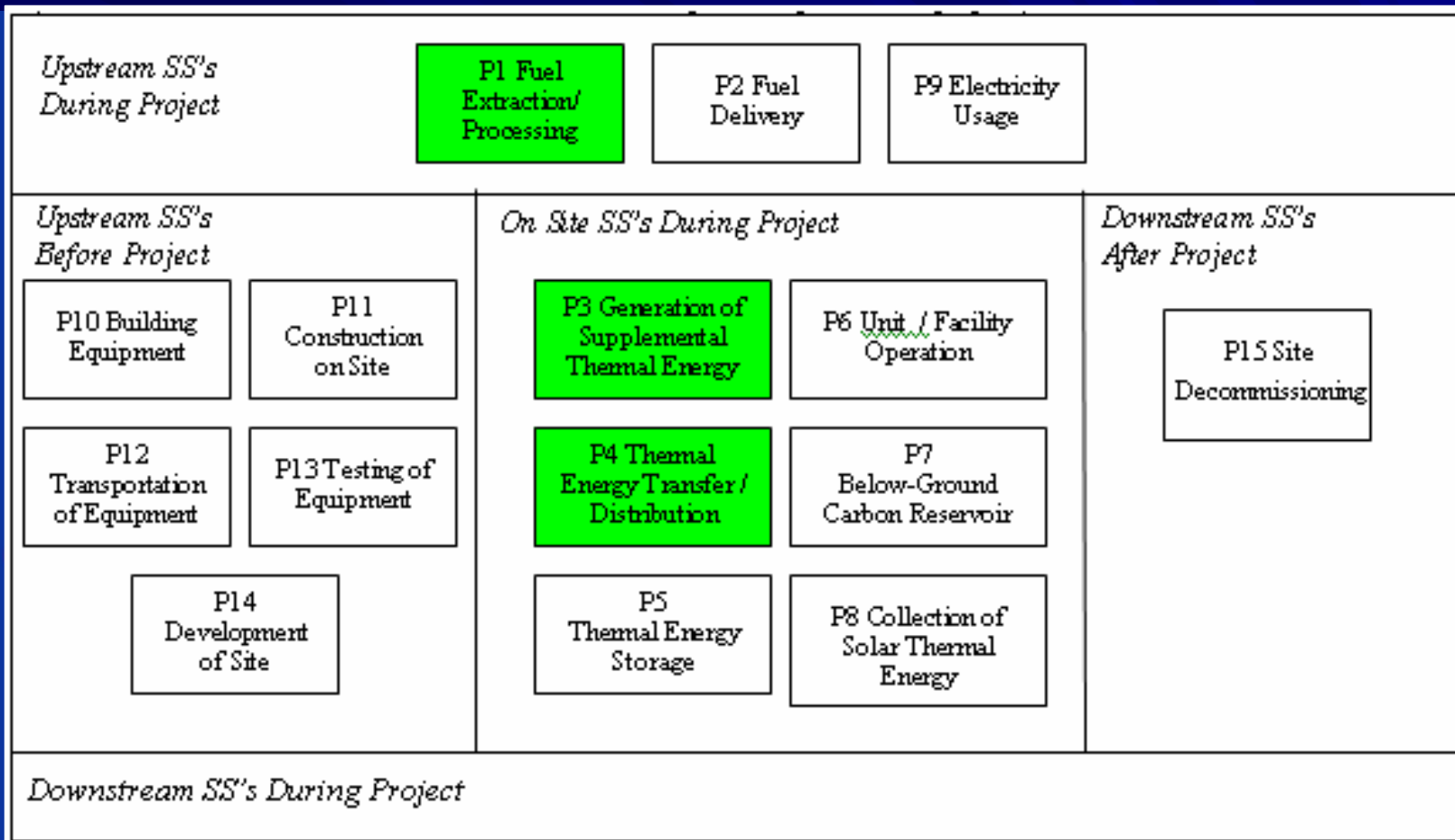
- **Emission Reduction Mechanisms**
 - Reduce the use of fossil-fuels to generate thermal energy
 - Direct and indirect reductions of GHG emissions by offsetting fossil-fuel derived energy through the conversion of solar radiation into useable thermal energy.
- **Applicability criteria:**
 - Metering to distinguish between solar and any fossil fuel based thermal energy generation downstream of both generation and any storage system;
 - Classification of the collector as either small (i.e. gross collector area less than 30 m²) or large, so as to define the applicable quantification approach;
 - Solar thermal energy is offsetting fossil fuel generated energy; and
 - No material impact on unit processes;

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- Flexibility mechanisms
 - Site specific emission factors;
 - Modification to measurement/data management to account for available equipment (meant for small scale projects);
 - Application of an alternate methodology for small projects (gross collector area of less than 30 m²) where direct metering is cost prohibitive. Involves;
 - Exclusion of the SS's P1, P9, P3, P4, B4, and B8;
 - Calculation of the SS B3 Generation of Thermal Energy using the volume of fuel offset, estimated assuming that each solar collector offsets a default quantity of natural gas usage per gross area and per year;
 - Exclusion of SS B8 Above-ground carbon reservoir if area of land cleared for the solar system is less than 1 hectare.

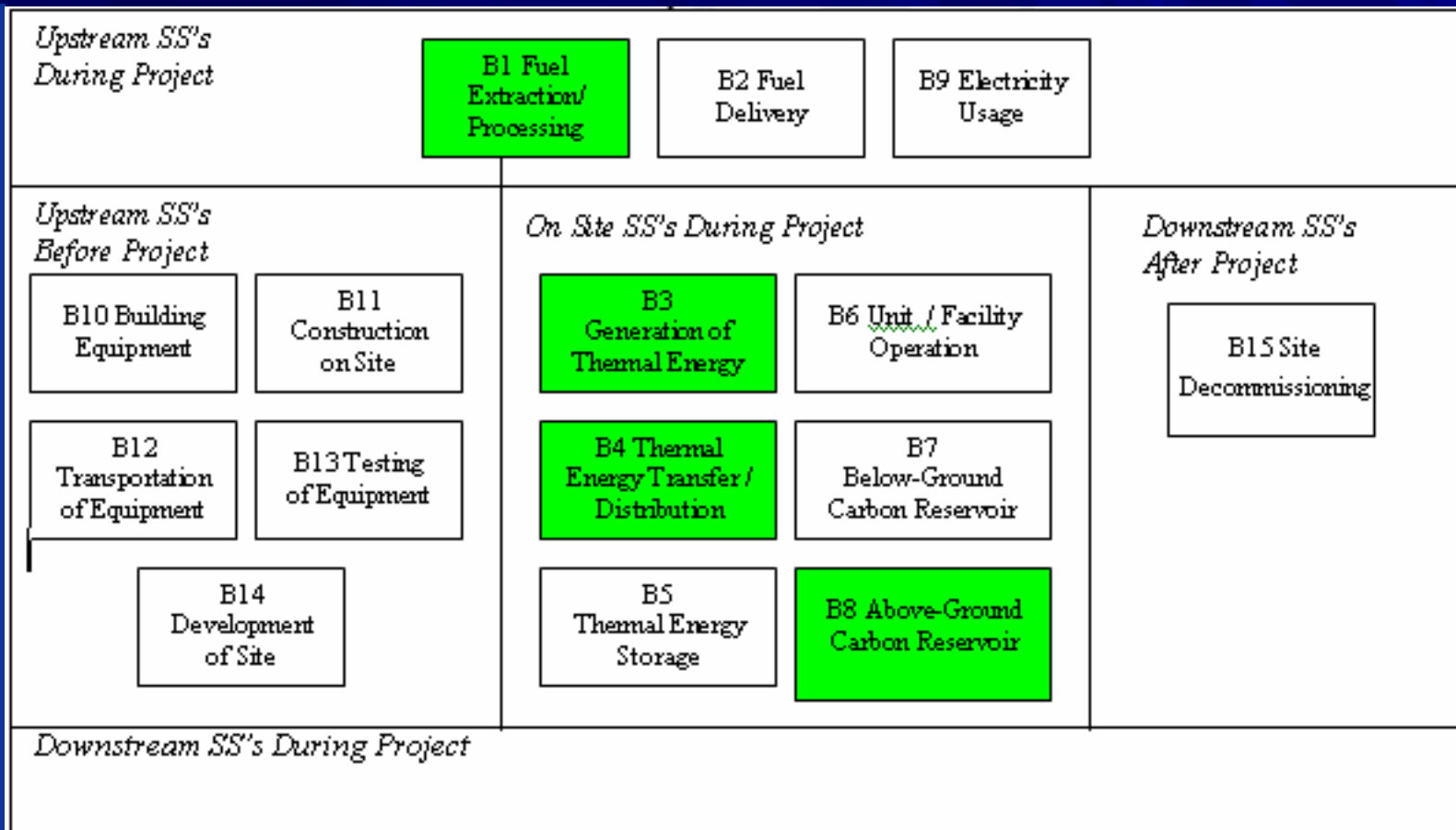
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Project Condition



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Baseline Condition



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$$\text{Emission Reduction} = \text{Emissions}_{\text{Baseline}} - \text{Emissions}_{\text{Project}}$$

$$\begin{aligned} \text{Emissions}_{\text{Baseline}} = & \text{Emissions}_{\text{Fuel Extraction and Processing}} \\ & + \text{Emissions}_{\text{Gen Thermal Energy}} + \text{Emissions}_{\text{Transfer / Distribution}} \\ & - \text{Sequestration Above-ground Carbon Reservoir}^1 * \text{Assurance Factor} \end{aligned}$$

$$\begin{aligned} \text{Emissions}_{\text{Project}} = & \text{Emissions}_{\text{Fuel Extraction and Processing}} \\ & + \text{Emissions}_{\text{Gen Sup Thermal Energy}} + \text{Emissions}_{\text{Transfer / Distribution}} \end{aligned}$$

- **Data Capture**

- Volume of fossil fuels combusted for thermal energy generation;
- Heat load generated from the solar thermal system;
- Supplemental heat load generated from fossil fuels in the project condition;
- Percent heating device/storage tank efficiency in the baseline condition.

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- Questions and Comments
 - Technical issues?
 - Policy concerns?
 - Questions?