The 2nd CDM Capacity Building Workshop in the Pacific
Under the EC ACP MEA Project

Examples of PDD

Atul Raturi

June 27-30, 2011, Suva Fiji

Project Design Document(PDD)

- Most important document in the CDM process
- Contains 7 parts and appendices
- Completed PDD is sent to DNA for issuance of approval letter
- PDD is publicly displayed for stakeholders' comments.

PDD structure

- Part A: Project introduction , salient features – basically similar to the PIN
- Part B: describes baseline methodology and additionality of the project
- Part C: Crediting period details
- Part D: Monitoring details
- Part E: Estimation of GHG reduction with a list of all formulae used
- Part F: Environmental and SD impact

PDD also contains stakeholders’ comments

PDD Example (Fiji Hydro)

A. GENERAL DESCRIPTION OF PROJECT ACTIVITY

A1. Title of the project activity

Vaturu and Wainikasou small-scale hydro project

A.2 Description of the project activity:

The proposed project activity is one small-scale hydro project bundling two measures into one PDD. The Vaturu and Wainikasou projects are small-scale run-of-river hydro projects in Fiji….. Total installed capacity of the Vaturu and Wainikasou projects are 3MW and 6.5MW, respectively

A.3 Project participants:

- Sustainable Energy Limited (SEL), project developer
- ABN AMRO BANK N.V. London Branch, CER purchaser from an Annex 1 Country

A.4 Technical description of the project activity:

A.4.1 Location of the project activity:

A.4.1.1 Host country Party: Fiji

A.4.1.2 Region/State/Province etc.: Viti Levu Island

A.4.1.3 City/Town/Community etc: Sabeto, Nandi Province (Vaturu project). Central highlands of Viti Levu in an area called Waimala-Naidasiri (Wainikasou project).

A.4.4 Public funding of the project activity:

The project will not receive any public funding from Parties included in Annex I.

A.4.5 Confirmation that the small-scale project activity is not a debundled component of a larger project activity:

According to Appendix C of the simplified modalities and procedures for small-scale CDM project activities, the SEL small-scale renewable energy projects are not part of a larger emission-reduction project.

A.4.2 Type and category(ies) and technology of project activity

Small Scale- Type/Category ID (Renewable Energy Projects / Renewable electricity generation for a grid).

A.4.3 Brief statement on how anthropogenic emissions of greenhouse gases (GHGs) by sources are to be reduced by the proposed CDM project activity:

The proposed activity will displace existing and future generation facilities in Fijian national electricity grid. Under the business as usual scenario there would be continuing growth in diesel based electricity generation capacity.

Total emission reductions from the electricity generated by the bundle of the projects are estimated as 523,488 tCO_{2e} over 21 years (crediting period), which means an average annual emission reduction of 24,928 tCO_{2e}.

List of formulae provided.

B. BASELINE METHODOLOGY

B.2 Project category applicable to the project activity:

Two options for baseline calculation:

(a) ***The average of the "approximate operating margin" and the "build margin"***

OR

(b) The weighted average emissions (in kgCO2/kWh) of the current generation mix.

Option (a) is selected .

From 2001 to 2002 demand for electricity grew by 5% with 623 GWh needed in 2002 in Fiji. With the Wailoa (Monasavu) hydro plant only capable of producing 448 GWh, the FEA has continued to rely on diesel generators to supply the additional electricity demanded. Demand is expected to continue to rise at approximately 5% per annum.

Formulae Used

Total emissions, E, are given by:

E(ton CO2/yr) = $\Sigma_J E_J$ (ton CO_2/yr) [1]

Where E_J = CO_2 emissions per year of the generation mode j, calculated by:

E_J (ton CO_2/yr) = PG_J (MWh/yr) * CEF_J (tCO2/TJ), [2]

Where PG_J = electricity generation of power plant j

CEF_J = emission capacity of the fuel-fired power plant j

Weighted average emission $<E>$, representing the emission intensity, is given by:

$<E>$ (ton CO2/MWh) = E (tCO2/yr) / PG (MWh/yr), [3]

Where E is given by equation (1);

also PG (MWh/yr) = $\Sigma_J PG_J$ (MWh/yr)

Equation 3 applies to both the operating margin and build margin cases.

The emission intensity coefficient, $\langle E \rangle$**baseline**, is

$\langle E \rangle$baseline (ton CO2/MWh) = {$\langle E \rangle$operating margin (tCO2/MWh) +
$\langle E \rangle$build margin (tCO2/MWh)} / 2

The baselines emissions, $\mathbf{E_{baseline}}$, are given by:

$E_{baseline}$ (ton CO2/yr) = $\langle E \rangle_{baseline}$ (tCO2/MWh) * PEG (MWh/yr)

Where PEG stands for the Project's electricity generation.

Difference between Baseline emissions and the project activity emissions represents the emission reductions due to the project activity during a given period. In this project activity emissions = 0 (Hydro)

The emission reduction = 0.656 tons CO2/MWh * 38,000 MWh/year = 24,928 tons CO2/year

B.3 Description of how the anthropogenic GHG emissions by sources are reduced below those that would have occurred in the absence of the proposed CDM project activity

The Project will result in the reduction of greenhouse gases that would not occur if the project were not implemented. The numerous barriers and risks associated with the implementation of the proposed project activity are identified.

Two scenarios are considered : 1)**The continuation of current activities**

2) The construction of two minihydro plants

Using simplified modalities and procedures for CDM small-scale project activities evidence to why the proposed project is additional is offered under the following categories of barriers:

(a) investment barrier,

(b) technological barrier, and

(c) prevailing practice.

B.4 Description of the project boundary for the project activity:

For Vaturu and Wainikasou this includes emissions from activities that occur at the project location related to the production of electricity from hydropower. the emissions related to production, transport and distribution of the fuel used in the power plants in the baseline are not included in the project boundary, as these do not occur at the physical and geographical site of the project. For the same reason the emissions related to the transport and distribution of electricity are also excluded from the project boundary.

C. DURATION OF THE PROJECT ACTIVITY AND CREDITING PERIOD

C.1.1. Starting date of the project activity (DD/MM/YYYY): 01/05/2004

C.1.2. Expected operational lifetime of the project activity: 50y-0m

C.2 Choice of the crediting period and related information:

C.2.1.1. Starting date of the first crediting period **(DD/MM/YYYY):** 01/06/2005

C.2.1.2. Length of the first crediting period: 7y-0m

D. Monitoring methodology and plan

D.1. Name and reference of approved methodology applied to the project activity:

Type I.D. Projects, the monitoring will consist of metering the electricity generated by the renewable technology

D.2. Justification of the choice of the methodology and why it is applicable to the project activity:

D.3 Data to be monitored:

ID n°	Data type	Data variable	Data unit	Measured (m), calculated (c) indicated (I)or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is archived data to be kept?	Comment
D.3.1	Electricity	Electricity Generation of the Project delivered to the Grid	MWh	M	Daily	100%	Electronic and paper	During the whole crediting period + 2 years	This item will be monitored by meters and through the electricity bill by the distribution company

D.4. Name of person/entity determining the monitoring methodology:

EcoSecurities Ltd. is the entity determining the monitoring plan and participating in the project as the CO2 Advisor. FEA is responsible for operating and maintaining the projectsOperations management is to be carried out by SEL under given parameters

Baseline Calculations

Operating Margin Data:

Plant Name	Technology	Fuel Type	MWh	MW	Fuel Consumption Unit	Fuel Consumption per year	Year Plant Online
Kinoya	Internal Combustion	diesel	132,138	35.51	litres	32,497,208	72,77,01
Vuda	Internal Combustion	diesel	83,282	24.08	litres	20,993,160	76, 01
Nadi	Internal Combustion	diesel	9,265	7.64	litres	2,564,347	68, 70
Sigatoka	Internal Combustion	diesel	4,298	8.88	litres	1,248,977	53 to 03
Deuba	Internal Combustion	diesel	3,926	1.7	litres	1,317,100	54 to 79
Rakiraki	Internal Combustion	diesel	1,808	1	litres	523,500	1997
Korovou	Internal Combustion	diesel	745	1.095	litres	236,970	99 to 04
Rokobili	Internal Combustion	diesel	4,292	3.3	litres	924,281	2003
Monasavu	Internal Combustion	diesel	123	0.155	litres	90,800.00	2003
Vatuwaka	Internal Combustion	diesel	5,106.00	5	litres	1,293,050.00	2003

Source: Fijian Electricity Authority (March 2004, obtained through personal communications)

Build Margin Data – 20% of recent plants built:

Plant Name	Technology	Fuel Type	Fuel Consumption (liters/year)	MWh	Cum Gen	% of capacity	Year Online
Sigatoka 5,6,7,8,9	Internal Combustion	diesel	618,862	2,130	2,130	0.35	2003
Korovou 2+3	Internal Combustion	diesel	157,980	496.67	2,626	0.43	2003
Rokobili	Internal Combustion	diesel	924,281	4,292	6,918	1.14	2003
Monasavu	Internal Combustion	diesel	90,800	123	7,041	1.16	2003
Vatuwaka	Internal Combustion	diesel	1,293,050	5,106.00	12,147	2.00	2003
Kinoya 3,4	Internal Combustion	diesel	19,163,377	77,921	90,068	14.86	2001
Vuda 3,4	Internal Combustion	diesel	10,984,793	43,578	133,646	22.04	2001

Source: Fijian Electricity Authority (March 2004, obtained through personal communications)

Calculation of Emission Factors:

Name	Technology	Fuel Type	kWh	liters/year	kWh /liter	Density (kg/l)	Carbon %	CEF (kg CO2/kWh)	kg CO2
Kinoya	Internal Combustion	diesel	132,138,000	32,497,208.00	4.07	0.83	86.10%	0.644	85,152,759
Vuda	Internal Combustion	diesel	83,282,000	20,993,160.00	3.97	0.83	86.10%	0.661	55,008,587
Nadi	Internal Combustion	diesel	9,265,000	2,564,347.00	3.61	0.83	86.10%	0.725	6,719,384
Sigatoka	Internal Combustion	diesel	4,298,000	1,248,977.00	3.44	0.83	86.10%	0.761	3,272,707
Deuba	Internal Combustion	diesel	3,926,000	1,317,100.00	2.98	0.83	86.10%	0.879	3,451,210
Rakiraki	Internal Combustion	diesel	1,808,000	523,500.00	3.45	0.83	86.10%	0.759	1,371,732
Korovou	Internal Combustion	diesel	745,000	236,970.00	3.14	0.83	86.10%	0.833	620,935
Rokobili	Internal Combustion	diesel	4,292,000	924,281.00	4.64	0.83	86.10%	0.564	2,421,903
Monasavu	Internal Combustion	diesel	123,000	90,800.00	1.35	0.83	86.10%	1.934	237,924
Vatuwaka	Internal Combustion	diesel	5,106,000	1,293,050.00	3.95	0.83	86.10%	0.664	3,388,192
		SUM:	244,983,000	Total kWh				SUM:	161,645,333

Sources: Plant data, FEA, 2003

Density - Kemps Engineering Handbook

Carbon % - Kemps Engineering Handbook

Approximate Operating Margin (OM) Calculation:		
Total kWh	Total kg CO_2	**OM (tCO_2/MWh)**
244,983,000	161,645,333	**0.66**

Build Margin:

Name	Technology	Fuel Type	kWh	liters/year	kWh/liter	Density	Carbon %	CEF (kg CO2/kWh)	Kg CO2
Sigatoka 5,6,7,8	Internal Combustion	diesel	2,129,640	618,862	3.44	0.83	86.10%	0.761	1,621,612
Korovou 2+3	Internal Combustion	diesel	496,667	157,980	3.14	0.83	86.10%	0.833	413,957
Rokobili	Internal Combustion	diesel	4,292,000	924,281	4.64	0.83	86.10%	0.564	2,421,903
Monasavu	Internal Combustion	diesel	123,000	90,800	1.35	0.83	86.10%	1.934	237,924
Vatuwaka	Internal Combustion	diesel	5,106,000	1,293,050	3.95	0.83	86.10%	0.664	3,388,192
Kinoya 3,4	Internal Combustion	diesel	77,920,859	19,163,378	4.07	0.83	86.10%	0.644	50,213,990
Vuda 3,4	Internal Combustion	diesel	43,577,791	10,984,793	3.97	0.83	86.10%	0.661	28,783,563
		SUM:	133,645,956	Total kWh				SUM:	87,081,140

Sources: Plant data, FEA, 2003

Density - Kemps Engineering Handbook

Carbon % - Kemps Engineering Handbook

Build Margin (BM) Calculation:		
Total kWh	Total kg CO_2	BM (tCO_2/MWh)
133,645,956	87,081,139.59	**0.65**

Baseline Emission Rate (BER) Calculation		
OM (tCO_2/MWh)	BM (tCO_2/MWh)	**BER (tCO_2/MWh)**
0.66	0.65	**0.656**

Calculation of Emission Reductions:

Emission Reduction Calculations for Vaturu + Wainikasou bundle:

	Year 1
Project Generation (MWh/year)	38,000
Average of Operating Margin and Build Margin CEF:	0.656
Total Emission Reductions:	24,928

F. ENVIRONMENTAL IMPACTS

Statements of Environmental Impact have been carried out for both the Vaturu and Wainikasou projects. Information contained in these reports suggests that there are no negative environmental impacts expected from the projects. Evidence of this is provided below through extracts from the Statement of Environmental Impact undertaken for Vaturu and Wainikasou by SEL.

G. STAKEHOLDERS COMMENTS

Extensive stakeholder consultation has been undertaken for both projects: Vaturu and Wainikasou.Specifically, for Vaturu the FEA has consulted the three stakeholders of the project and obtained their approvals for power generation from the Water Treatment Plant. Regarding the landowners, meetings with them were undertaken and their issues addressed, so the “landowners finally agreed to the consent put forward to them by FEA”, as described in the stakeholder consultation report for Vaturu.

As for the Wainikasou project, the land where the project will be implemented is acquired Native Land by

the State. Although no landowners would be involved in the project (i.e., it is State land), consultation

was undertaken with the Native Land Trust Board, with positive results.

PDD Example (CHP, Brazil)

A. GENERAL DESCRIPTION OF PROJECT ACTIVITY

A1. Title of the project activity : Lucélia Bagasse Cogeneration Project (LBCP).

A.2. Description of the project activity: This project activity consists of increasing efficiency in the bagasse (a renewable fuel source, residue from sugarcane processing) cogeneration facility. By investing to increase in steam efficiency in the sugar and alcohol production and increase in the efficiency of burning the bagasse (more efficient boilers), Lucélia generates surplus steam and uses it exclusively for electricity production (through turbo-generators).

A.3. Project hosts: Brazil

Partcipants : Private entity Central de Álcool Lucélia Ltda, Private entity Econergy. Brasil Ltda

A.4. Technical description of the project activity

Lacation : Lucélia, Sao Paulo, Brazil

A.4.3. Technology to be employed by the project activity:

The predominant technology in all parts of the world today for generating megawatt (MW) levels of electricity from biomass is the steam-Rankine cycle, which consists of direct combustion of biomass in a boiler to generate steam, which is then expanded through a turbine.

A.4.4. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed CDM project activity

By dispatching renewable electricity to a grid, electricity that would otherwise be produced using fossil fuel is displaced. This electricity displacement will occur at the system's margin, i.e. this CDM project will displace electricity that is produced by marginal sources (mainly fossil fueled thermal plants) which have higher electricity dispatching costs and are solicited only over the hours that baseload sources (low-cost or must-run sources) cannot supply the grid (due to higher marginal dispatching costs or fuel storage – in case of hydro sources – constraints).

A.4.4.1. Estimated amount of emission reductions over the chosen crediting period:

Annual average over the crediting period of estimated reductions (tonnes of CO2e) **= 14.362**

Total Number of crediting years = 7

A.4.5. Public funding of the project activity:

There is no public funding involved in Annex I in this project activity

SECTION B. Application of a baseline methodology

B.1. Title and reference of the approved baseline methodology applied to the project activity:

AM0015: Bagasse-based cogeneration connected to an electricity grid.

B.1.1. Justification of the choice of the methodology and why it is applicable to the project activity:

This methodology is applicable to LBCP due to the fact that (i) the bagasse is produced and consumed in the same facility – Lucélia -; (ii) the project would never be implemented by the public sector, as well as it would not be implemented in the absence of CDM, as shown in the additionality chapter below; (iii) there is no increase on the bagasse production due to the project activity itself/ and (iv) there will be no bagasse storage for more than one year.

B.2. Description of how the methodology is applied in the context of the project activity:

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity: Application of the Tool for the demonstration and assessment of additionality for LBCP. Additionality criteria.

Barrier analysis. I. **Technological Barriers, II. Institutional and Political Barriers. III. Economic and Investment Barriers, IV. Cultural Barrier**

Common practice analysis: The sugar sector, historically, always exploited its biomass (bagasse) in an inefficient manner by making use of low-pressure boilers. no surplus electric energy is available for sale, and no sugar company has ventured in the electricity market until recent years.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the project activity:

Bagasse cogeneration plant: the bagasse cogeneration plant considered as boundary comprises the whole site where the cogeneration facility is located.

Baseline energy grid: For LBCP, the South-Southeast and Midwest

Formulae Used in baseline calculations

D.2.1.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

$EF_{OM,simple\_adjusted,y} = (1-\lambda_y)\frac{\sum_{i,j} F_{i,j,y}.COEF_{i,j}}{\sum_j GEN_{j,y}} + \lambda_y \frac{\sum_{i,k} F_{i,k,y}.COEF_{i,k}}{\sum_k GEN_{k,y}}$ (tCO_2e/GWh) $EF_{electricity} = \frac{EF_{OM} + EF_{BM}}{2}$ (tCO_2e/GWh) $BE_{electricity,y} = EF_{electricity} \cdot EG_y$	$F_{i,j(or\ m),y}$ Is the amount of fuel i (in a mass or volume unit) consumed by relevant power sources j in year(s) y j,m Refers to the power sources delivering electricity to the grid, not including low-operating cost and must-run power plants, and including imports4 from the grid $COEF_{i,j(or\ m)\ y}$ Is the CO2 emission coefficient of fuel i (tCO2 / mass or volume unit of the fuel), taking intoaccount the carbon content of the fuels used by relevant power sources j (or m) and the percent oxidation of the fuel in year(s) y, a $GEN_{j(or\ m),y}$ Is the electricity (MWh) delivered to the grid by source j *(or m)* $BE_{electricity,y}$ Are the baseline emissions due to displacement of electricity during the year y in tons of CO_2 w_{OM}, w_{BM} Are the weights given to the operating margin (OM) and the build margin (BM) in the emission factor calculation. EG_y Is the net quantity of electricity generated in the bagasse-based cogeneration plant due to the project activity during the year y in MWh, and $EF_{electricity,y}$ Is the CO_2 baseline emission factor for the electricity.

D.2.4. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

$ER_y = BE_{thermal,y} + BE_{electricity,y} - PE_y - L_y$ $BE_{thermal,y} = 0$ $PE_y=0$ $L_y=0$	ER_y: are the emissions reductions of the project activity during the year y in tons of CO_2 $BE_{electricity,y}$: Are the baseline emissions due to displacement of electricity during the year y in tons of CO_2 $BE_{thermal,y}$: Are the baseline emissions due to displacement of thermal energy during the year y in tons of CO_2
$BE_{electricity,y} = EF_{electricity} \cdot EG_y$	PE_y: Are the project emissions during the year y in tons of CO_2. L_y: Are the leakage emissions during the year y in tons of CO_2.

D. Monitoring methodology and plan

D.4 Please describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity

1.The monthly readings of the calibrated meter equipment must be recorded in an electronic spreadsheet;

2. Sales receipt must be archived for double checking the data. In case of inconsistency, these are the data to be used.

SECTION E. Estimation of GHG emissions by sources

E.1. Estimate of GHG emissions by sources:

This project activity does not burn any additional quantity of fossil fuel due to the project implementation. Therefore, the variable PEy, presented in the methodology, does not need to be monitored.

Thus, **PEy = 0**

E.2. Estimated leakage:

Lucélia did not sell sugarcane bagasse before the implementation of LBCP.

Thus, **Ly = 0**

E.3. The sum of E.1 and E.2 representing the project activity emissions:

$Ly + PE_y = 0$

:

E.4. Estimated anthropogenic emissions by sources of greenhouse gases of the baseline

Simple Adjusted Operating Margin Emission Factor Calculation

According to the methodology, the project is to determine the Simple Adjusted OM Emission Factor ($EF_{OM,\ simple\ adjusted,\ y}$) . Therefore, the following equation is to be solved:

$$EF_{OM,simple\_adjusted,y} = (1-\lambda_y)\frac{\sum_{i,j} F_{i,j,y}.COEF_{i,j}}{\sum_j GEN_{j,y}} + \lambda_y \frac{\sum_{i,k} F_{i,k,y}.COEF_{i,k}}{\sum_k GEN_{k,y}} \ (tCO_2e/GWh)$$

It is assumed here that all the low-cost/must-run plants produce zero net emissions.

$$\frac{\sum_{i,k} F_{i,k,y}.COEF_{i,k}}{\sum_k GEN_{k,y}} = 0 \ (tCO_2e/GWh)$$

The emissions reductions of this project activity are:

$$ER = BE_{electricity,y} - (L_y + PE_y) = 0{,}2677\ tCO_2/MWh\ .\ EG_y - 0 \rightarrow \mathbf{ER = 0{,}2677\ tCO_2/MWh\ .\ EG_y}$$

Emission reductions

Year	Estimation of project activity emission reductions (tonnes of CO_2e)	Estimation of the baseline emission reductions (tonnes of CO_2e)	Estimation of leakage (tonnes of CO_2e)	Estimation of emission reductions (tonnes of CO_2e)
2002	2.873	0	0	2.873
2003	4.367	0	0	4.367
2004	4.528	0	0	4.528
2005	5.354	0	0	5.354
2006	27.804	0	0	27.804
2007	27.804	0	0	27.804
2008	27.804	0	0	27.804
Total (tonnes of CO_2e)	100.534	0	0	100.534

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

The secretary of environment and CETESB already analyzed the most relevant impacts from the project activity through the RAP (Preliminar Environmental Report), and the issuance of the working license attests Lucélia's compliance with the environmental legislation and environmental responsibility.

SECTION G. Stakeholders' comments

G.1. Brief description how comments by local stakeholders have been invited and compiled

As a requirement of the Brazilian Interministerial Commission on Global Climate Change, the Brazilian DNA, Lucélia invited several organizations and institutions to comment the CDM project being developed.

Operating and Build Margins

Operating Margin

A 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, without requirement to monitor and recalculate the emissions factor during the crediting period,

$$EF_{grid,OMsimple,y} = \frac{\sum_{i,m} FC_{i,m,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y}}{\sum_{m} EG_{m,y}} \qquad \textbf{(1)}$$

Where:

$EF_{grid,OMsimple,y}$ = Simple operating margin CO_2 emission factor in year *y* (tCO_2/MWh)

$FC_{i,m,y}$ = Amount of fossil fuel type *i* consumed by power plant / unit *m* in year *y* (mass or volume unit)

$NCV_{i,y}$ = Net calorific value (energy content) of fossil fuel type *i* in year *y* (GJ / mass or volume unit)

$EF_{CO2,i,y}$ = CO_2 emission factor of fossil fuel type *i* in year *y* (tCO_2/GJ)

$EG_{m,y}$ = Net electricity generated and delivered to the grid by power plant / unit *m* in year *y* (MWh)

Build Margin

The build margin emissions factor is the generation-weighted average emission factor (tCO2/MWh) of all power units *m* during the most recent year *y* for which power generation data is available Include The set of five power units that have been built most recently

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \qquad \textbf{(12)}$$

Where:

$EF_{grid,BM,y}$	=	Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EG_{m,y}$	=	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$	=	CO_2 emission factor of power unit m in year y (tCO_2/MWh)
m	=	Power units included in the build margin
y	=	Most recent historical year for which power generation data is available

The CO_2 emission factor of each power unit m ($EF_{EL,m,y}$) should be determined as per the guidance in step 3 (a) for the simple OM, using options B1, B2 or B3, using for y the most recent historical year for which power generation data is available, and using for m the power *units* included in the build margin.

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Thank You