INFORMATION NOTE ON THE CONCEPT OF TECHNICAL AREAS AND RELATED COMPETENCE FOR VALIDATIONS AND VERIFICATIONS

Cover note

1. The attached information note contains a concept of technical areas and related competence. The note was developed by the CDM-AP, with support of the secretariat, to provide a basis for the revision of relevant sections of the CDM Accreditation Standard.

2. The Board may wish to consider the note and provide further guidance, specifically on the following areas:

(a) Definition of a technical area:

A technical area (TA) within a CDM sectoral scope is a sub-sector or a group of sub-sectors defined based on the difference or similarities in technical processes, methodologies, monitoring requirements and environmental impacts that lead to specific competence requirements to undertake validation and/or verification activities.

(b) Proposed technical areas within the sectoral scopes, i.e.:

(i) Splitting sectoral scopes 1, 2, 8, 10 into two technical areas each;

(ii) Splitting sectoral scope 4 (Manufacturing industries) into multiple technical areas, to be defined by each AE/DOE individually;

(iii) Not splitting other sectoral scopes into multiple technical areas;

(c) Approach to defining required competence for each technical area, based on the combination of:

(i) Educational background;

(ii) Direct or related work experience in the relevant field;

(iii) Successful validation/verification experience;

(iv) Training;

(b) Differentiation between “complex technical areas” and other technical areas with regard to required competence, i.e.:

(i) Stricter competence requirements for complex technical areas, always requiring a direct working experience (and relevant education);

(ii) Less stricter and several options of competence requirements for other technical areas.

INFORMATION NOTE

CONCEPT OF TECHNICAL AREAS AND RELATED COMPETENCIES FOR VALIDATIONS AND VERIFICATIONS

A. Background

1. The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP), at its fifth session, through the decision 2/CMP.5 encouraged the Executive Board of the clean development mechanism (CDM) to continue to develop measures to enhance the impartiality, independence and technical competence of designated operational entities (DOEs) and to develop arrangements to protect from undue prejudice proposed CDM project activities that are undergoing validation and verification by a DOE that has lost its accreditation status or had this status suspended.

2. The Board at its fifty-second meeting requested the CDM Accreditation Panel (CDM-AP), supported by the secretariat, to undertake a thorough analysis with regard to competence requirements for different functions within validations and verifications, methodologies and projects, including the definition of technical areas and appropriate deployment of technical expertise.

B. Terms and definitions

3. Technical area (TA) within a CDM sectoral scope is a sub-sector or a group of sub-sectors defined based on the difference or similarities in technical processes, methodologies, monitoring requirements and environmental impacts that lead to specific competence requirements to undertake validation and/or verification activities.

4. Complex technical area is a technical area that requires the validation/verification team to apply multi-disciplinary knowledge and skills to perform complex tasks related to a particular technical area which by its nature:

(a) Has many diverse and autonomous but interrelated and interdependent components linked through many (dense) interconnections; and

(b) Can operate in different configurations and as a whole exhibit one or more properties (behaviour among the possible properties) not obvious from the properties of the individual parts.

5. Competence is the demonstrated ability to apply knowledge and skills to achieve intended results. Skills are gained over a period of learning though education, application through working experience and training.

C. Objective

6. The concept of technical areas has been introduced to further subdivide, where relevant, the CDM sectoral scopes for the analysis of competence requirements for validation and verification activities. The objective of this note is to define the concept of technical areas and explain the approach used to identify the technical areas as well as their specific competence requirements.

D. General approach

7. A DOE's validation/verification team shall have the competence in the technical area(s) of a CDM project activity that it is validating/verifying or shall be supported by qualified personnel in that technical area(s).

8. This note defines technical areas for the CDM sectoral scopes and identifies and establishes the requirements for the technical qualification of personnel in each technical area to ensure that members of a validation/verification team, including where applicable a technical expert, collectively have the necessary competence. These requirements are further established as a combination of knowledge and skills.

9. Qualification for the assessment of technical areas within CDM sectoral scopes are elaborated in section G below. Personnel with demonstrated competencies within these technical areas are qualified to perform in the role of validator/verifier/technical expert to fulfil requirements in the establishment of a team for each sectoral scope/technical area for which the qualification is granted.

10. The basis of this work involves the determination and demonstration of the competence required to understand and assess the technical elements of a CDM project activity within a specific technical area.

11. To accomplish this task, an analysis of the technical areas was undertaken to define and distinguish various technical areas as per their relevance and associate them to the CDM sectoral scopes to which a technical area belongs. The rationale for this distinction has been presented in section F. The associated competencies against each of these technical areas are also identified.

12. An applicant entity (AE) or DOE is required to demonstrate how its personnel have acquired the required competencies before their qualification to the relevant technical areas.

E. Knowledge

(1) Educational and knowledge background

13. Analysing the fifteen CDM sectoral scopes (SSs) and the methodologies linking these sectoral scopes, the following sector specific educational background is relevant for CDM sectoral scopes:

(i) SS 6 (Construction): knowledge that might be obtained through civil or construction related education or equivalent;

(ii) SS 7 (Transport): knowledge that might be obtained through transportation related education or equivalent;

(iii) SS 14 (Afforestation and reforestation): knowledge that might be obtained through forestry related education or equivalent;

(iv) SS 15 (Agriculture): knowledge that might be obtained through agriculture related education or equivalent;

(v) All other sectoral scopes: knowledge that might be obtained through disciplines in sciences, engineering, economics or equivalent

14. Related formal education could be [one or] a combination of Advance Diplomas, Bachelor, Master and higher or equivalent.

(2) Experience

15. Depending on the complexity of the technical area, experience shall be demonstrated through one or a combination of the following requirements:

- **2 (a)**: Direct work experience in the field (with a minimum of 1 year in a technical area and 3 years in a complex technical area) for technical areas within the sectoral scopes; and/or
- **2 (b)**: Related work experience project management or consultancy; and/or
- **2 (c)**: Number(s) of successful qualification[1] in validation/verification under-training and observation of a technical area within a sectoral scope qualified validator/verifier;

16. Direct work experience in the field is mandatory for the complex technical areas and relevant experience is gained through direct engagement[2] with industries and involvement in the processes of specific facilities within these identified complex technical areas.

17. The fulfilment of requirements for work experience relate to initial qualification of the AE/DOE personnel. The AE/DOE is responsible for establishing a system for continual monitoring the knowledge of its personnel qualified to the technical areas within sectoral scopes.

18. Complex technical areas are:

(i) SS 1, TA 1.1: thermal energy generation from fossil fuel and biomass including thermal electricity from solar;

(ii) SS 4, TA 4.1 to TA 4.*n*: i.e. technical areas of cement, aluminium, iron and steel, refinery, food, mechanical industries etc.;

(iii) SS 5, TA 5.1: chemical process industries;

(iv) SS 8 and SS 10, TA 8/10.2: oil and gas industry.

(3) Training

19. The following training measure is anticipated to fulfil this requirement:

- Attendance at qualified/accredited short-term technical course and/or seminar (*which may or may not have an examination component*) related to a technical area/sectoral scope.

[1] For qualification based on the number of validation and verification experience the following is proposed:
(a) 2 numbers of validation/verification activities as Assessor Under-Training, accompanying an validator/verifier already qualified for the technical area within the sectoral scope in question;
(b) Followed by a successful performance of 2 numbers of validation/verification activities under observation of a qualified validator/verifier/technical expert in the technical area within the sectoral scope in question.

[2] Engagement through activities that allow knowledge of the processes, their interaction and different operating parameters in relation to final output of facility(ies).

F. Rationale for division of sectoral scopes into technical areas

Complex technical area

- TA 1.1: Thermal energy and thermal electricity generation from fossil and biomass fuels has diverse interrelated and interdependent components such as boilers, turbines, heat exchangers with different configurations making this a complex technical area. Possible specific working experience in the field could cover experiences with power plant operation (coal and natural gas - utility/non-utility based) and biomass-based power plants (e.g. agriculture residue, cogeneration plants)
- TA 5.1: Chemical process industries by the nature of their interrelated components, operations conducted in different configurations and the interlinkages between these components are diverse. An example would be assessing energy efficiency measures in chemical industries that requirerequiring an analysis and understanding of the various interrelations and interdependencies of the its various parts.
- TA 4.*n*: Process/technology for each sub-sector under the sectoral scope ”manufacturing industries” has been considered as a separated technology area. Since each of these process/technology is characterized byunique with diverse technical processes that operating in different configurations making this a complex technical area. The listed technical areas (from 4.1 to 4.n) are illustrative but not exhaustive and based on the currently approved CDM methodologies under this sectoral scope.
- TA 8/10.2 (TA 8.2 and TA 10.2): Technical processes for sectoral scope 8 and sectoral scope 10 relating to oil field flaring, oil and gas process flaring, operate in different configurations which are complex and as a whole exhibit one or more properties though with similar methodological and monitoring requirements.

Technical area

- TA 1.2: Technology sub-sectors such as wind, hydro, solar photovoltaic solar etc., [which are of an intermittent nature] and have the same output having similar monitoring requirements irrespective of the technology type, and methodologies do not need an evaluatione of the core technologies for purposes to estimate the emission reductions. Hence these sub-sectors are clubbed together as one technical area.
- TA 2.1 and TA 2.2: Distinction in these technical areas is based on the type of energy being distributed, whether it is electricity or heat based distribution. Direct working experience under these techical areas would be in construction/design/consultancy relating to power transmission/distribution
- TA 8/10.1 (TA 8.1 and TA 10.1): Mining and mineral processes, coal mine methane recovery and fugitive emissions from solid fuels are of similar nature and these technical areas are clubbed together.
- TA 11/12.1 (TA 11.1 and TA 12.1): Based on the similarities in technical processes, monitoring requirements and environmental impacts sectoral scope 11 and sectoral scope 12 are clubbed together with sectoral scope 5. This technical area, in comparison to TA 5.1, needs no assessment of interlinkages in its operations and an example would be that of recovery and destruction project activities.

G. Sectoral scope, technical areas and required technical competencies for personnel

Function - Validation

SS 1: Energy industries (renewable/non-renewable sources)

Technical areas:

- **TA 1.1: Thermal energy generation from fossil fuels as well as thermal electricity from solar;**
- **TA 1.2: Energy generation from renewable energy sources.**

Competencies:

- **For TA 1.1**: 1[3] and 2[4] (a)
- **For TA 1.2**: 1 and 2 (a) **or** 1 and 2 (b) and 3[5] **or** 1 and 2 (c) and 3

SS 2: Energy distribution

Technical areas:

- **TA 2.1: Electricity distribution**
- **TA 2.2: Heat distribution**

Competencies:

- **For TA 2.1:** 1 and 2 (a) **or** 1 and 2 (b) and 3 **or** 1 and 2 (c) and 3
- **For TA 2.2**: 1 and 2 (a) **or** 1 and 2 (b) and 3 **or** 1 and 2 (c) and 3

SS 3: Energy demand

Technical areas:

- **TA 3: Energy demand**

Competencies:

- **For TA 3**: 1 and 2 (a) **or** 1 and 2 (b) and 3 **or** 1 and 2 (c) and 3

[3] Educational background as defined in section E (1) above.
[4] Experience as defined in section E (2) above.
[5] Training as defined in section E (3) above.

SS 4: Manufacturing industries

Technical areas:

Consider one technical area for each sub-sector i.e. cement, aluminum, iron and steel, refinery, food, mechanical industries etc.

- **TA 4.1: Cement sector**
- **TA 4.2: Aluminum**
- **TA 4.3: Iron and steel**
- **TA 4.4: Refinery**

  ...

- **TA 4.*n***

Competencies:

- **For TA 4.1→TA 4.*n***: 1 and 2 (a) in each technical area
  - **e.g. for TA 4.1**: 1 and 2 (a) in the cement industry

SS 5: Chemical industry
SS 11: Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride
SS 12: Solvents use

Technical areas:

- **TA 5.1: Chemical process industries**
- **TA 11/12.1: Chemical process industries**

Competencies:

- **For TA 5.1**: 1 and 2 (a)
- **For TA 11/12.1**: 1 and 2 (a) **or** 1 and 2 (b) and 3 **or** 1 and 2(c) and 3

SS 6: Construction

Technical area:

- **TA 6.1: Construction**

Competencies:

- **For TA 6.1**: 1 and 2 (a) **or** 1 and 2 (b) and 3 **or** 1 and 2 (c) and 3

SS 7: Transport

Technical areas:

- **TA 7.1: Transport**

Competencies:

- **For TA 7.1**: 1 and 2 (a) **or** 1 and 2 (b) and 3 **or** 1 and 2 (c) and 3

SS 8: Mining/mineral production
SS 10: Fugitive emissions from fuels (solid, oil and gas)

Technical areas:

- **TA 8/10.1: Mining and mineral processes, excluding those included in TA 8/10.2 below**
- **TA 8/10.2: Oil and gas industry, coal mine methane recovery and use**

Competencies:

- **For TA 8/10.1**: 1 and 2 (a) **or** 1 and 2 (b) and 3 **or** 1 and 2 (c) and 3
- **For TA 8/10.2**: 1 and 2 (a)

SS 9: Metal production

Technical areas:

- **TA 9.1: Metal production**

Competencies:

- **For TA 9.1**: 1 and 2 (a) **or** 1 and 2 (b) and 3 **or** 1 and 2 (c) and 3

SS 13: Waste handling and disposal

Technical areas:

- **TA 13.1: Waste handling and disposal**

Competencies:

- **For TA 13.1**: 1 and 2 (a) **or** 1 and 2 (b) and 3 **or** 1 and 2 (c) and 3

SS 14: Afforestation and reforestation

Technical areas:

- **TA 14.1: Forestry**

Competencies:

- **For TA 14.1**: 1 and 2 (a) **or** 1 and 2 (b) and 3

SS 15: Agriculture

Technical areas:

- **TA 15.1: Agriculture**

Competencies:

- **For TA 15.1**: 1 and 2 (a) **or** 1 and 2 (b) and 3

H. Function - Verification

20. Fulfilment of qualification for validation function in each of the sectoral scopes and associated technical areas also addresses requirements for qualifications for verification function. However, the following knowledge or prior professional qualification should be additionally considered to qualify personnel for verification function:

(a) Instrumentation and metrological/calibration expertise; or

(b) Management system (e.g. ISO 9001 or ISO 14001 or ISO 17025 or equivalent).

21. Thus, it needs to be assessed if above requirement is fulfilled by any of the verification team members for the sectoral scope/technical area under verification to qualify the verification team.

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Matrix: Note on technical areas and related competencies

Sectoral Scope (SS) / Technical Area (TA)	Relevant Educational Background 1	Experience			Training 3
		Direct Work Experience 2 (a)	Related work experience 2 (b)	Assessments under Observation 2 (c)	
SS 1					
TA 1.1	X	X			
TA 1.2	X	X			
	X		X		X
	X			X	X
SS 2					
TA 2.1	X	X			
	X		X		X
	X			X	X
TA 2.2	X	X			
	X		X		X
	X			X	X
SS 3					
TA 3.1	X	X			
	X		X		X
	X			X	X
SS 4					
TA 4.1→ 4.*n*	X	X			
SS 5, SS 11 and SS 12					
TA 5.1	X	X			
TA 11/12.1	X	X			
	X		X		X
	X			X	X

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Sectoral Scope (SS) / Technical Area (TA)	Relevant Educational Background 1	Experience			Training 3
		Direct Work Experience 2 (a)	Related work experience 2 (b)	Assessments under Observation 2 (c)	
SS 6					
TA 6.1	X	X			
	X		X		X
	X			X	X
SS 7					
TA 7.1	X	X			
	X		X		X
	X			X	X
SS 8 and SS 10					
TA 8/10.1	X	X			
	X		X		X
	X			X	X
TA 8/10.2	X	X			
SS 9					
TA 9.1	X	X			
	X		X		X
	X			X	X
SS 13					
TA 13.1	X	X			
	X		X		X
	X			X	X
SS 14					
TA 14.1	X	X			
	X		X		X
	X			X	X
SS 15					
TA 15.1	X	X			
	X		X		X