

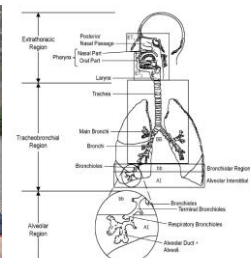
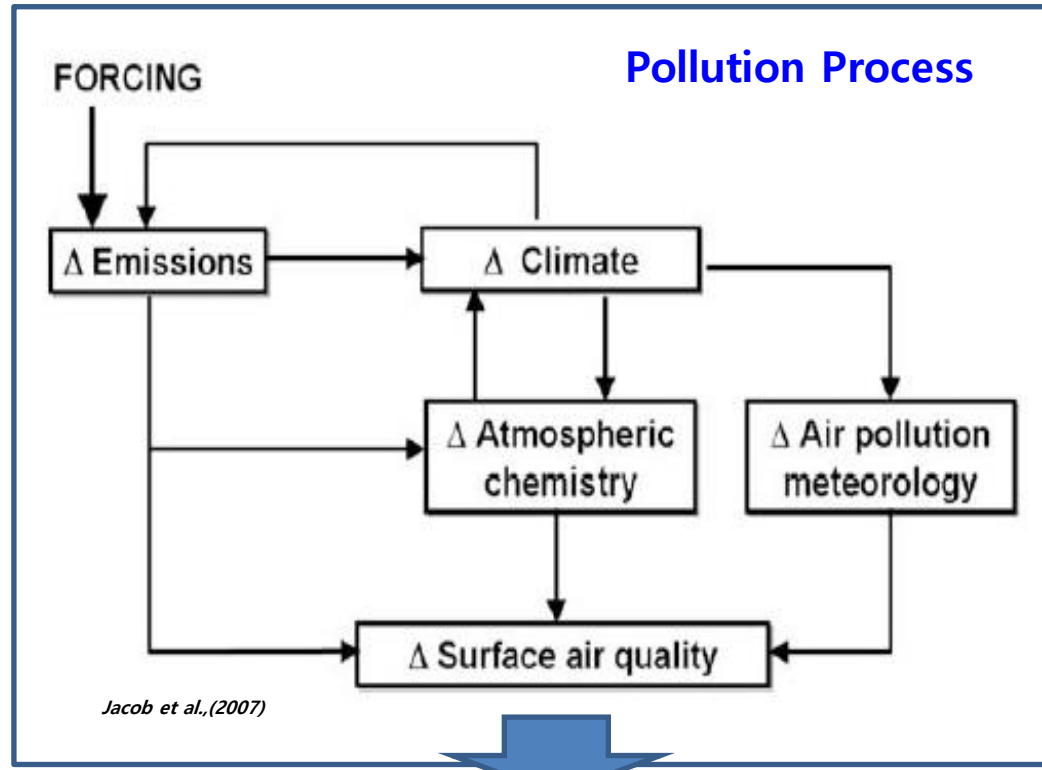
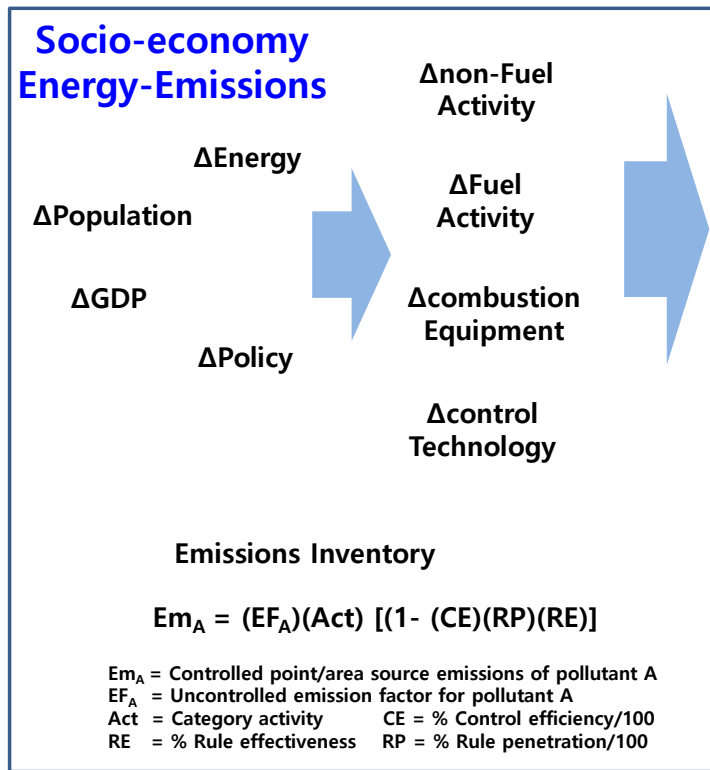
Potential NEACAP approaches and activities on emission inventory

Woo, Jung Hun

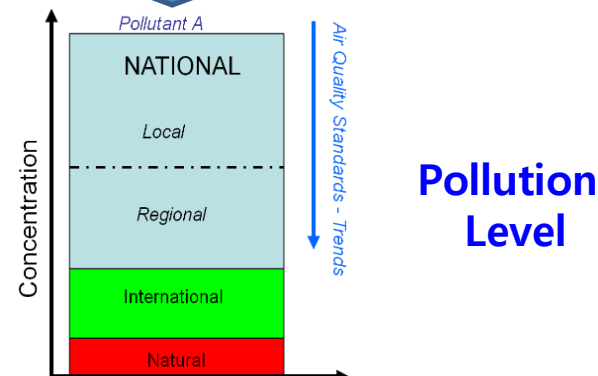
Jun 2, 2020

Konkuk University, Korea

Integrated Aspects of Air Pollution

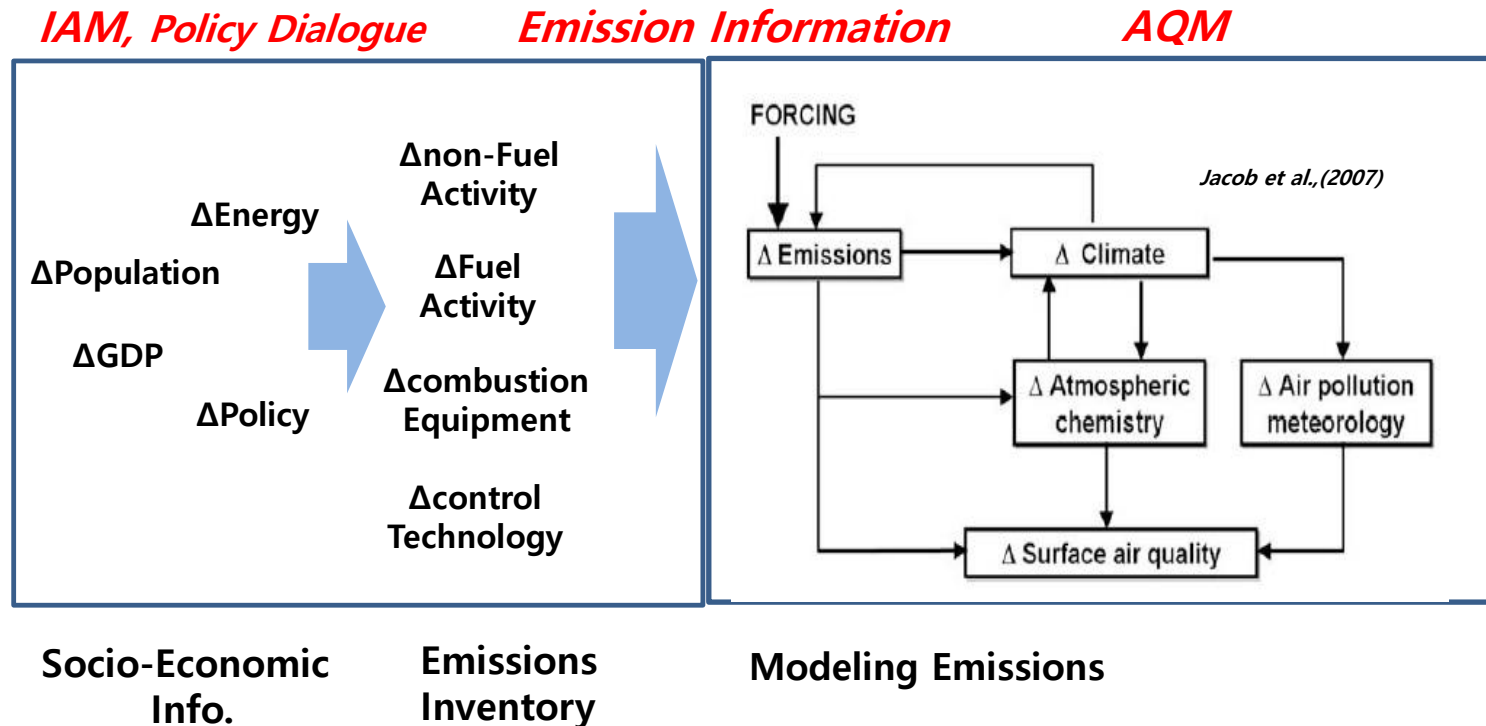


Health Impact = Concentration x Intake



Emission Inventory(EI)

as a basis for Science and Policy Assessment

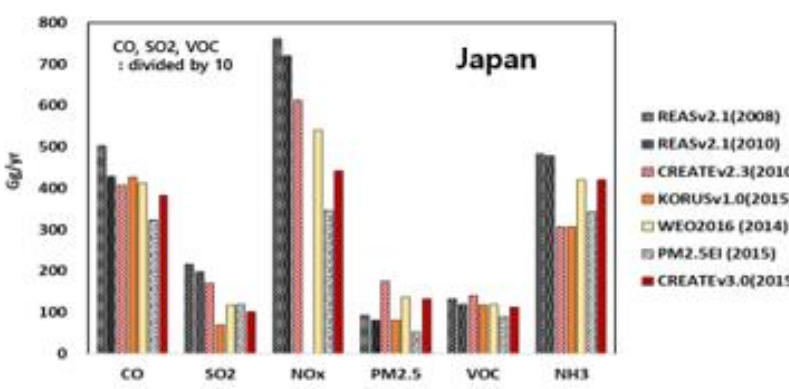
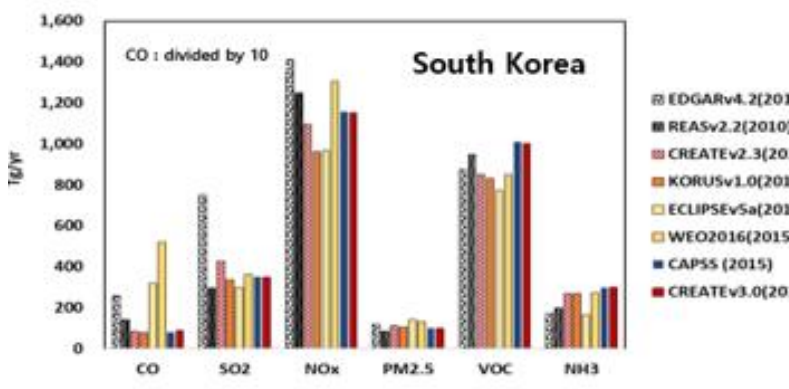
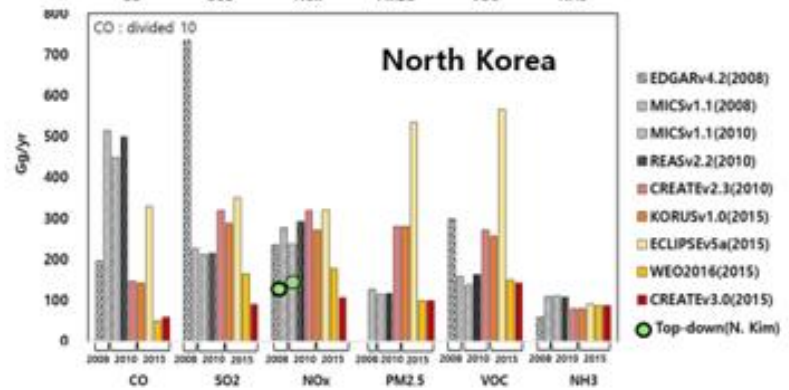
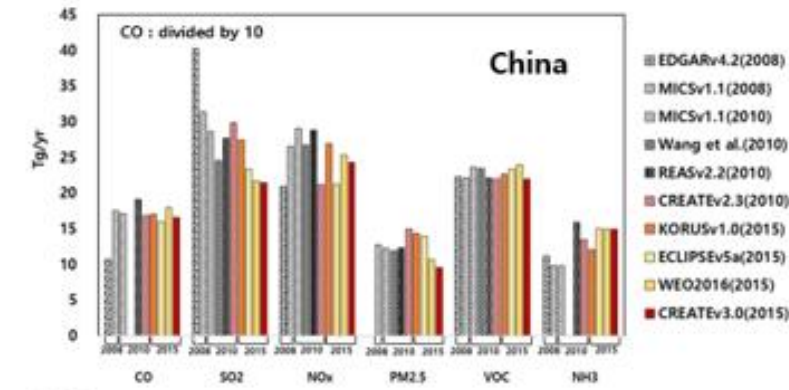
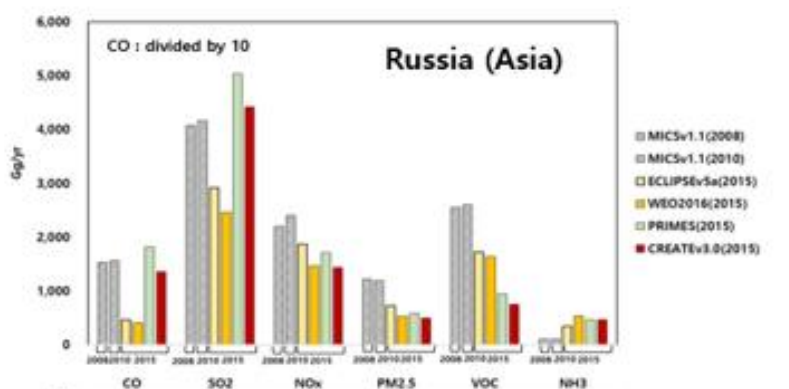
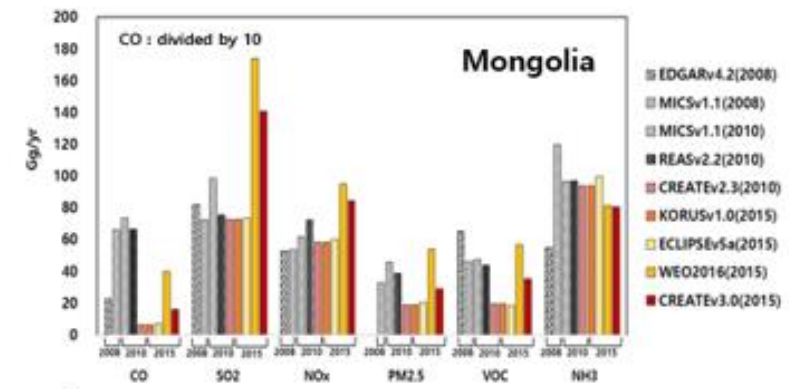


- Emission Inventory could be a basis and a link for any air quality related activities
- Emission Inventory can serve NEACAP as a basis for Integrated Assessment Modeling(IAM), Air Quality Modeling(AQM), Scientific Assessment Report(SAR)
- Understanding emissions, in line with other NEACAP activities, should be a crucial component of NEACAP success

List of Existing Emission Inventories over Northeast Asia

Inventory	Geographical Scope /Type	Spatial (deg)	Temporal	Years	Sector / Pollutants
EDGARv4.2	Global/Activity	0.1x0.1	Annual	1970~2008	Anthropogenic / Biom. burning / Int. shipping / Aviat CO ₂ , CH ₄ , N ₂ O, F-gas, CO, NO _x , SO ₂ , NH ₃ , VOCs, PM ₁₀
RCPs EI	Global/Activity	0.5x0.5	Monthly (bydecade)	2000 – 2100	Anthropogenic / Biom. burning / Int. shipping / Aviat CO ₂ , CH ₄ , N ₂ O, F-gas, BC, OC, CO, NO _x , SO ₂ , NH ₃ , VO
ECLIPSE	Global/Activity	0.1x0.1	Annual /Monthly	1990-2050	Anthropogenic (All GHGs, APs) CO ₂ , CH ₄ , N ₂ O, CO, NO _x , NMVOC, NH ₃ , PM ₁₀ , PM _{2.5} , S
TRACE-P	Asia/Activity	0.5x0.5	Annual	2000	Anthropogenic/Biomass burning/International shipping SO ₂ , NO _x , CO, NMVOC, NH ₃ , OC, BC, CO ₂ , CH ₄
INTEX	Asia/Activity(Mosaic)	0.5x0.5	Annual	2006	Anthropogenic: SO ₂ , NO _x , CO, NMVOC, OC, BC, PM ₁₀ , PM _{2.5}
REAS	Asia + Russia /Activity(Mosaic)	0.25x0.25	Monthly	2000-2008	Anthropogenic: SO ₂ , NO _x , CO, NMVOC, PM ₁₀ , PM _{2.5} , BC, OC, NH ₃ , CH and CO ₂ Soil NO _x and others
CREATE	Asia + Russia /Activity	0.1x0.1	Annual	2010,2015	Anthropogenic/BiomBurning/Biogenic CO ₂ , CH ₄ , N ₂ O, CO, NO _x , NMVOC, NH ₃ , PM ₁₀ , PM _{2.5} , S
MICS-Asia (MIX)	Asia + Russia /Mosaic	0.25x0.25	Monthly	2008, 2010	Anthropogenic: SO ₂ , NO _x , CO, NMVOC, NH ₃ , CO ₂ , PM _{2.5} , PMC, BC, OC
KORUS-AQ	Asia+Russia /Mosaic	0.1x0.1	Monthly	2015	Anthropogenic/Biogenic: SO ₂ , NO _x , CO, NMVOC, NH ₃ , CO ₂ , PM _{2.5} , PM ₁₀ , BC, O
LTP	Korea, China, Japan, and Northeast Asia	0.1x0.1	Monthly	2017(China) ,2015(Korea , Japan)	Anthropogenic/Biogenic: SO ₂ , NO _x , CO, NMVOC, NH ₃ , PM _{2.5} , PM ₁₀
MEIC	China/Activity	0.25x0.25	Monthly	2012-2015	Anthropogenic: SO ₂ , NO _x , CO, NMVOC, NH ₃ , CO ₂ , PM _{2.5} , PM ₁₀ , BC, C
JEI-DB	Japan/Activity	1kmx1km	Monthly	2000, 2005,2010	Anthropogenic: CO, NO _x , NMVOC, NH ₃ , PM ₁₀ , PM _{2.5} , SO ₂
CAPSS	ROK /Activity	1kmx1km	Annual	1999-2016	Anthropogenic: CO, NO _x , NMVOC, NH ₃ , TSP, PM ₁₀ , PM _{2.5} , SO ₂

Differences and Changes among the Existing Emissions Inventories



Potential Benchmark EI Activity and System : CEIP / EMEP

CEIP* (EMEP**)

The screenshot shows the CEIP website homepage. At the top, it features the EMEP logo and the CEIP logo (CEIP umweltbundesamt). Below the header is a navigation bar with links for Home, Contact, Links, Disclaimer, and Search. The main content area is titled 'Centre on Emission Inventories and Projections' and contains several featured sections, each with a numbered callout:

- 1** CEIP
- 2** CEIP Reports
- 3** Reporting Instructions
- 4** Check your inventory (RepDab)
- 5** Status of reporting
- 6** WebDab (Emission database)
- 7** Interactive data viewers
- 8** Review of Inventories
- 9** Review results

On the left side, there is a 'Main Tab' menu with the following items:

- 1 CEIP
- 2 CEIP Reports
- 3 Reporting Instructions
- 4 Check your inventory (RepDab)
- 5 Status of reporting
- 6 WebDab (Emission database)
- 7 Interactive data viewers
- 8 Review of Inventories
- 9 Review results
- Amended GP
- Gothenburg protocol
- Adjustments under the Gothenburg protocol (GP)
- The EMEP grid

The main content area also includes sections for 'NEWS', 'ESIG VOC inventory', and 'Links'. The 'NEWS' section contains two items: 'Joint CEIP/MSC-E technical report on emission inventory improvement for HMs modeling' and 'Joint CEIP/MSC-E technical report on emission inventory improvement for POPs modeling'. The 'ESIG VOC inventory' section mentions that CEIP was asked by ESIG to publish the link to the updated VOC inventory data.

* Center on Emission Inventories and Projections
 ** European Monitoring and Evaluation Programme

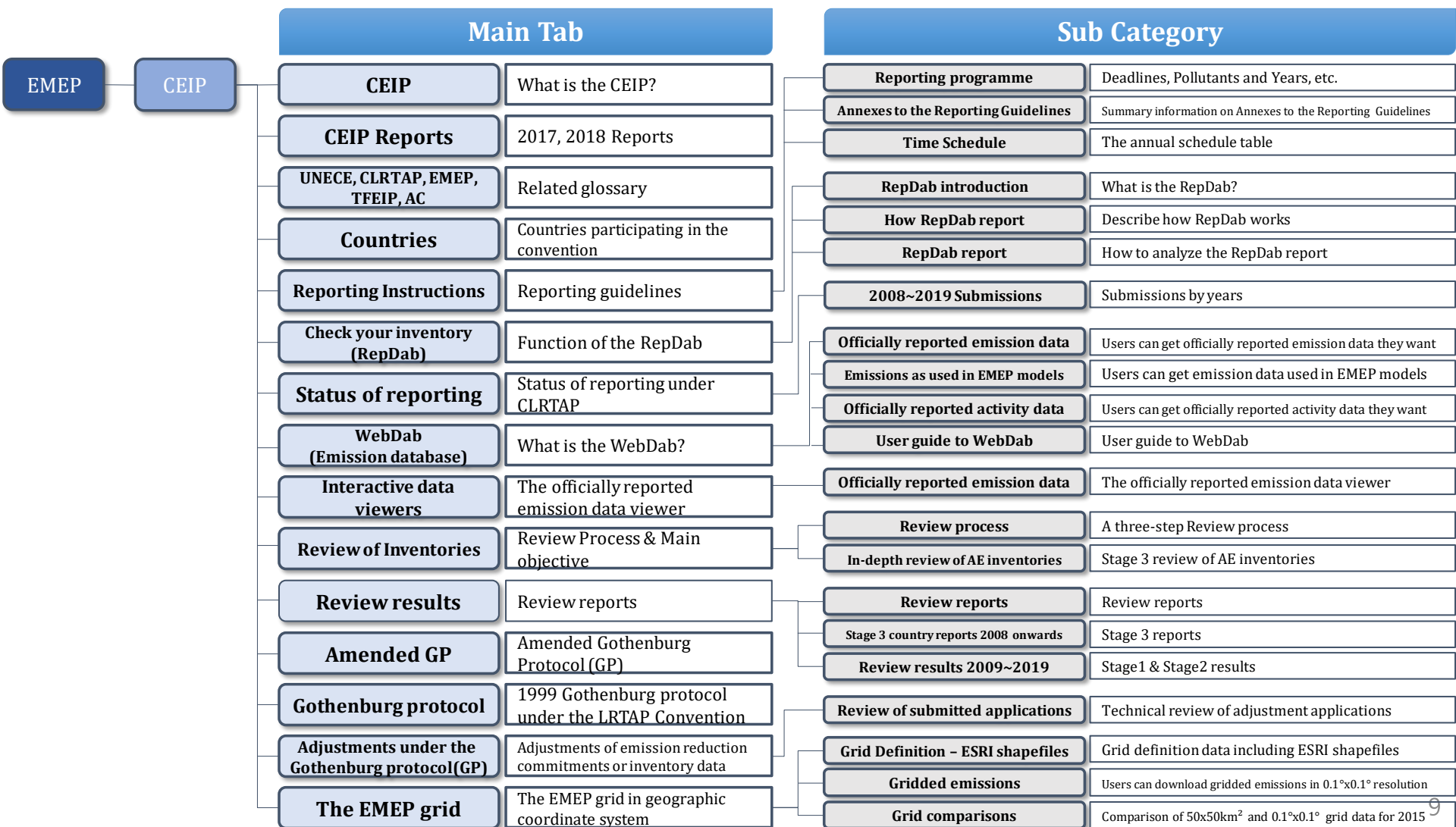
- ✓ Technical reports
- ✓ Guideline
- ✓ Information user need to know
- ✓ Glossary

- ✓ Related Links
- Home > Links
- Links
- Convention on Long-range Transboundary Air Pollution (CLRTAP)
 - EMEP website
 - Task force on emission inventories and projections (TFEIP)
 - Centre for Integrated Assessment Modelling (CIAM)
 - Chemical Co-ordinating Centre of EMEP (CCC)
 - Meteorological Synthesizing Centre - East (MSC-E)
 - Meteorological Synthesizing Centre - West (MSC-W)
 - European Environment Agency (EEA)
 - European Topic Centre on Air Pollution and Climate Change Mitigation (ETC/ACM)

- ✓ How to contact
- Home > Contact
- Contact
- Visitor's entry and postal address:
 Umweltbundesamt
 Spittelauer Lände 5
 1090 Vienna/Austria
 emep.emissions@umweltbundesamt.at

Potential Benchmark System : CEIP / EMEP

CEIP (EMEP)



Potential Emission Inventory approaches for NEACAP

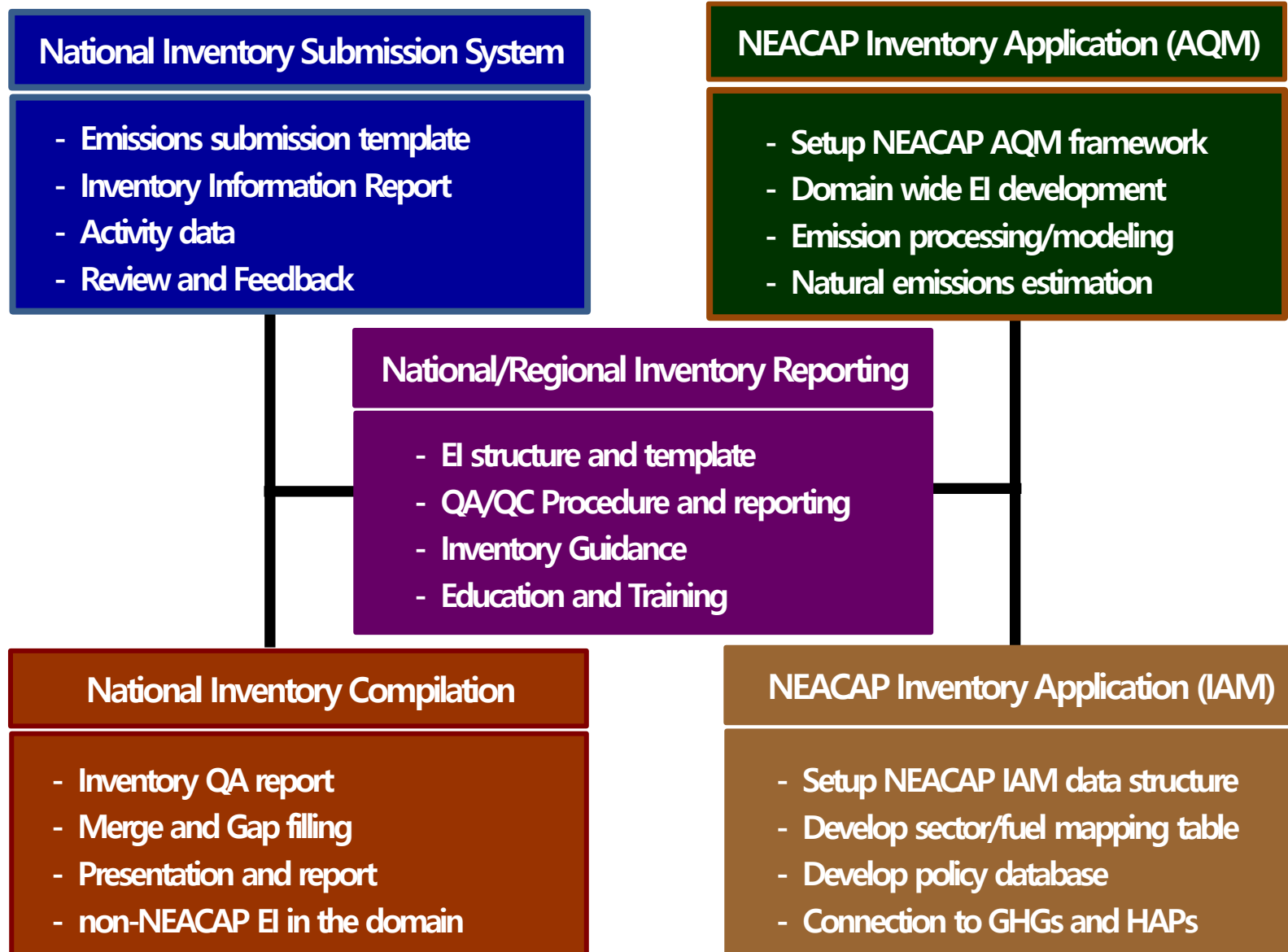
Objectives

- Develop an emissions Inventory which can effectively serve NEACAP as a basis for Integrated Assessment Modeling(IAM), Air Quality Modeling(AQM), Scientific Assessment Report(SAR), and other activities

Approaches

- Develop an activity-based, regional emissions inventory based on the information submitted by member countries and other sources
- NEACAP regional emissions also need to be compiled as domain wide modeling emissions inventory, including emissions processing/modeling of anthropogenic and natural sources
- NEACAP EI need to be compiled and provide services using the NEACAP standard system by WGEI and EITC

Suggested Components and Functions for the NEACAP Emission Inventory System



Suggested Components and Functions for the NEACAP Emission Inventory System

- Potential pollutants list : Starts from Criteria Air Pollutants(CAPs : CO, SO₂, NO_x, NH₃, VOCs, PM₁₀, PM_{2.5}) and then may extend to the GHGs and HAPs in the future
- Emission Inventory Technical Center (EITC) need to collect and QA/QC emission-related inputs annually using the standard system developed for NEACAP
- Emissions Inventory working Group (WGEI) needs to work together to develop standard methodologies to develop, QA/QC, combine NEACAP EI and collaborate with other NEACAP activities, such as IAM, SAR
- Gap-filling, training, capacity building, workshops would be important missions for EITC under the support of WGEI

Officially reported emission data

EI System

Emissions of NO_x (as NO₂) (kilotonnes), European Union (EU 28)

How to use RepDab

The RepDab check table to scan data files in the new reporting format as specified in Annex IV Reporting template of the 2014 Reporting Guidelines (ECE/EB.AIR/2014/4), except Table 28 and data in Sub-Annex. RepDab will be used to check data in the old WRI data (Guidelines ECE/EB.AIR/2014/4). For more information please read the RepDab introduction.

Substituted table: Examples of a RepDab report

Read from RepDab works

EI Guidbook EEA Report | No 13/2019

EMEP/EEA air pollutant emission inventory guidebook 2019

Technical guidance to prepare national emission inventories

ISBN 977-9449

Home > Reporting Instructions

Reporting Instructions

Article 8 of 1979 Convention:
 "The Contracting Parties, within the framework of the Executive Body referred to in article 10 and hereinafter, shall, in their common interests, exchange available information on:
 - data on emissions at periods of time to be agreed upon, of agreed air pollutants, starting with sulphur dioxide, coming from grid units of agreed size; or on the fluxes of agreed air pollutants, starting with sulphur dioxide, across national borders, at distances and at periods of time to be agreed upon..."

2018/2019 updates

Annex II (template for IIR) Reporting information on condensible (to be used 2018) and Annex III (2018/2019) by EITC. RepDab - Revised version after approved by EMEP SB, shall be used for reporting under EMEP SB 2018 onwards.

2014 Reporting guidelines

At its thirty-second session (Geneva, 9-13 December 2013), the Executive Body for the UNEP Convention adopted revised guidelines for reporting emissions and projections data under the Convention (2013 EB Decision: ECE/EB.AIR/12/AM.L.1, 2013/3 and 2013/4). 2014 Reporting guidelines (ECE/EB.AIR/12/2 (2014/AM.L.1)) are adopted for application in 2015 and subsequent years. The document is a revised version of the 2009 Guidelines for Reporting Emission Data under the Convention (ECE/EB.AIR/9/7), which were approved by the Executive Body in 2008 (ECE/EB.AIR/9, para. 83 (b)). French (PDF, 142KB) and Russia (PDF, 201KB) version of revised guidelines. Here you can access Annexes to the revised 2014 reporting guidelines.

Reporting Instructions

Home > Reporting Instructions > Annexes to the Reporting Guidelines

Annexes to the Reporting Guidelines

This page provides summary information on Annexes to the 2014 Guidelines for Estimating and Reporting Emission Data.

Annex I: Emissions reporting template (XLS, 153KB) - National totals and NFR sector emissions for main pollutants, PM, POPs, HAPs and activity data

Annex II: Recommended structure for the Informative Inventory Report (IIR) - Documentation of methods, trends, recalculations, activity data and other information relevant for understanding the inventory. REVISED in 2019

Annex III: Notification template (DOC, 930KB) - To inform the UNEP secretariat of the contents of the data submission

Annex IV: Projections reporting template (XLS, 160KB) - Projections of national emissions and activity parameters of main pollutants and PM

Annex V: Gridded emissions template - Aggregated NFR sector data (GNFR)

Annex VI: LPS emissions template (XLS, 237KB) - LSP data for each relevant aggregated NFR sector (GNFR)

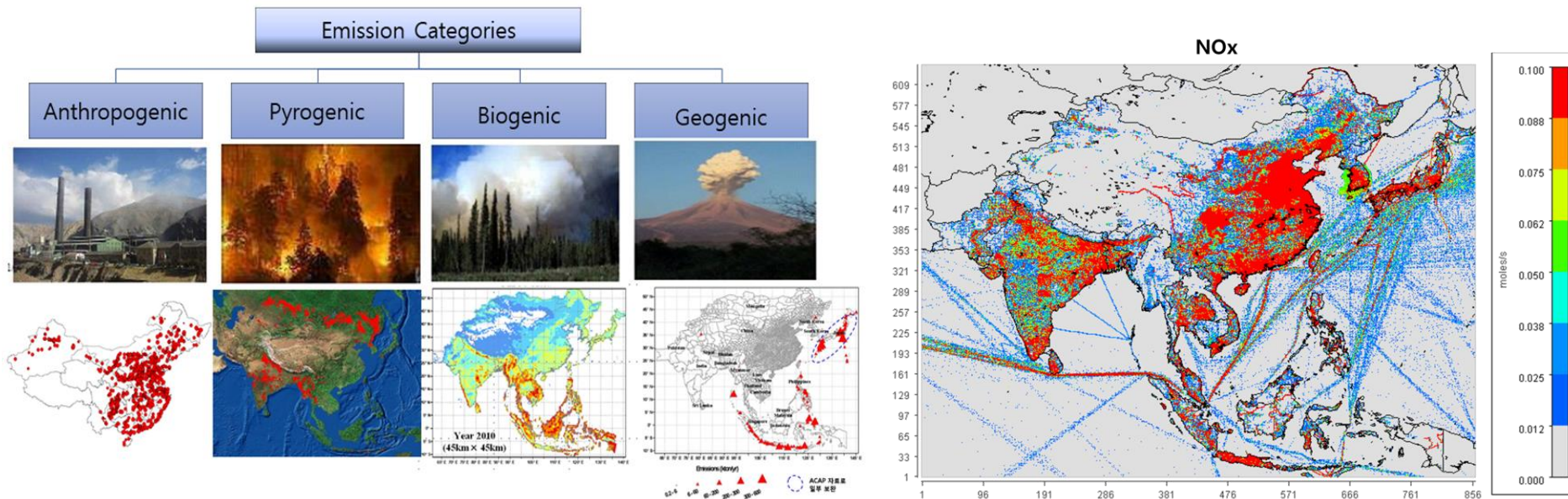
Annex VII: Adjustments summary template - Approved adjustments Declaration on consistent reporting of approved adjustments

Extended guidance (PDF, 492KB) on reporting of national totals

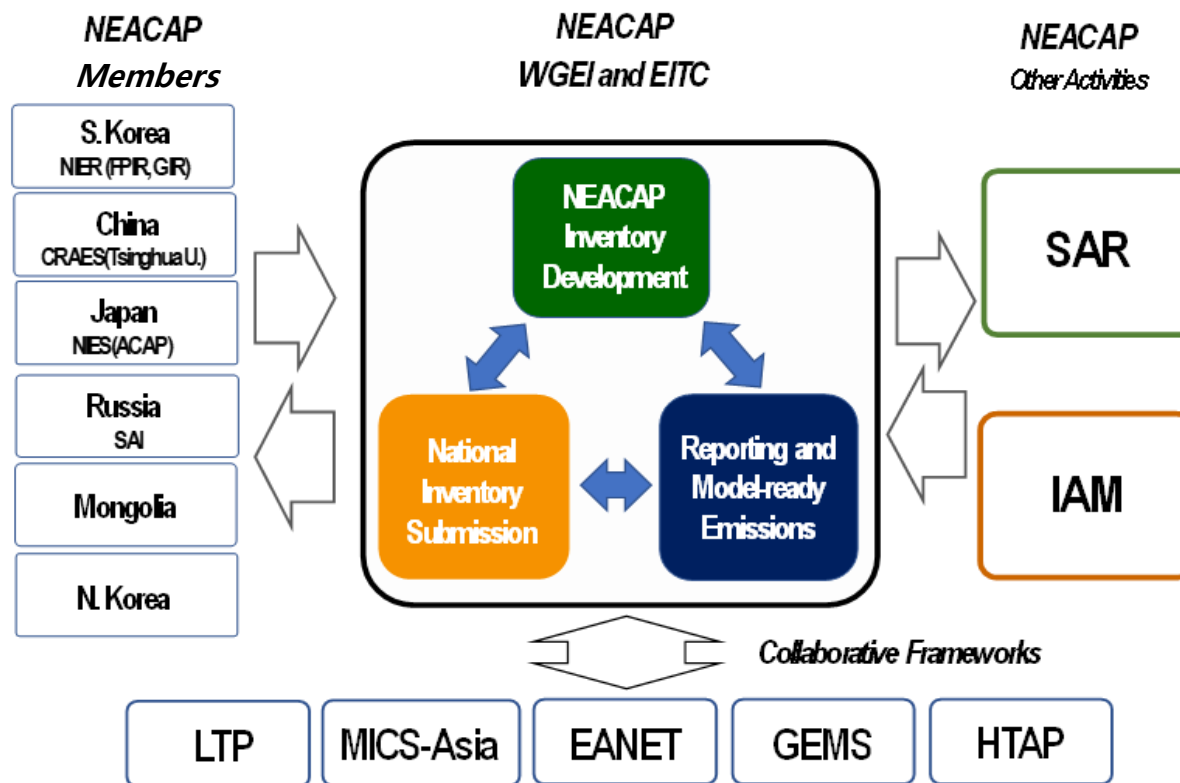
The EMEP grid

Suggested Components and Functions for the NEACAP Emission Inventory System

- WGEI and EITC need to compile domain wide NEACAP emissions and support other NEACAP activities, such as IAM, SAR.
- The emissions need to be further processed (spatio-temporal allocation, chemical speciation, etc) in support of air quality modeling and SAR.
- Emission-related inputs, such as energy activity data, should be reviewed and compiled in support of other NEACAP activities, such as IAM and Policy Dialogue.



Institutional arrangements and practical work



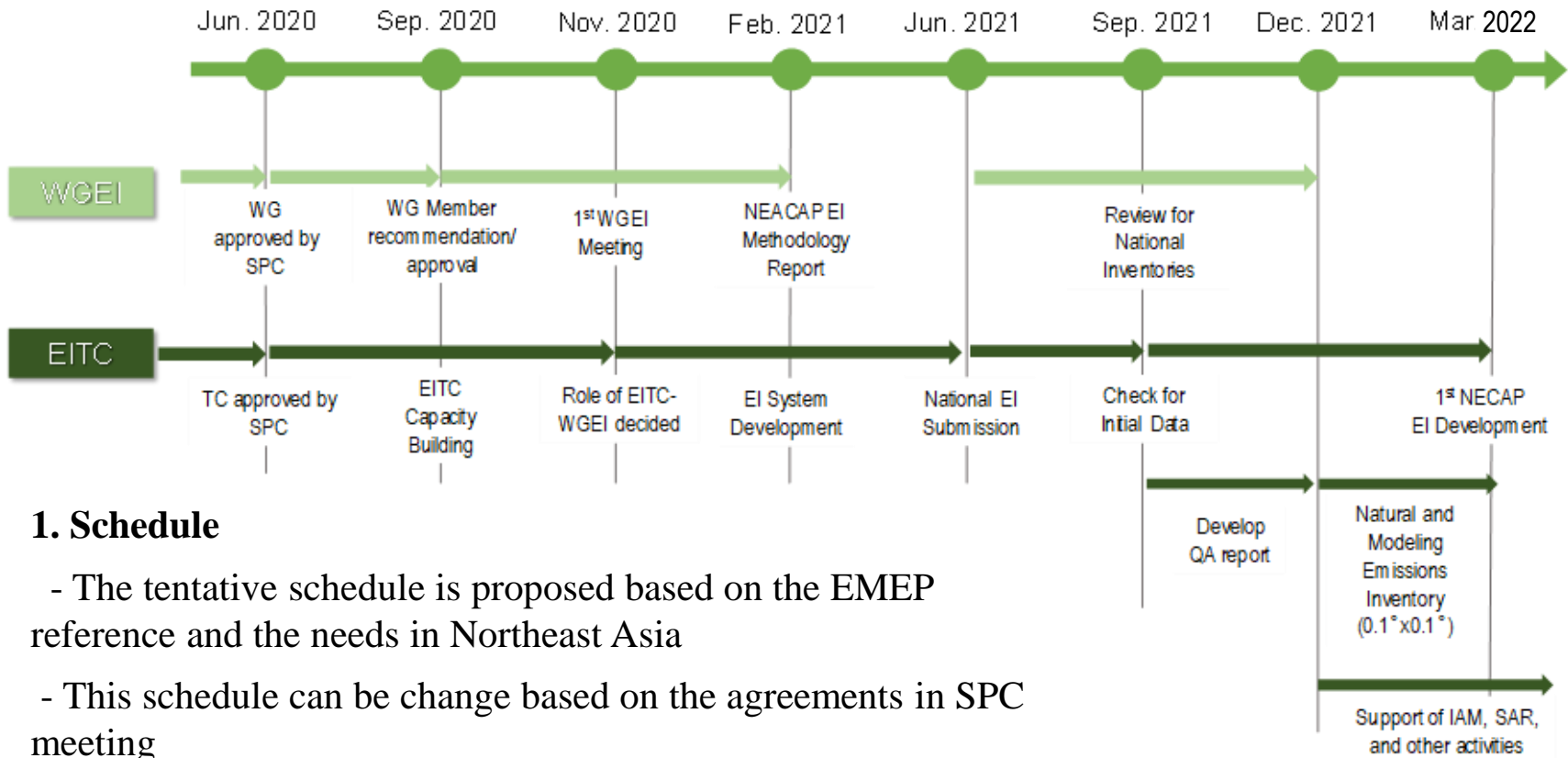
1. Establish WGEl

- Member selection (by SPC)
- Develop consensus on NEACAP EI compilation methodology
- Develop methodological framework of NEACAP EI
- Get emission-related information from the member countries
- Review and maintain NEACAP EI

2. Establish EITC

- A center selection (by SPC)
- Develop methodology and system to compile NEACAP EI
- Develop emission inventory, modeling emissions
- Support WGEl and other NEACAP activities

Schedule and Issues



1. Schedule

- The tentative schedule is proposed based on the EMEP reference and the needs in Northeast Asia

- This schedule can be change based on the agreements in SPC meeting

2. Issues

- How “official” the related data should be? Can we accept research-based data?
- Any confidentiality issues in the input data? Need to set up data service policy.
- Budget for the activities



Thank you!

고맙습니다!

Спасибо!

Баярлалаа!

谢谢!

ありがとうございます!