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European Aviation Safety Agency



THAILAND's ACTION PLAN to Reduce Aviation Emission: Climate Change Implementation Elements for CAAT

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18 OCT 2018

*This project is funded by the European Union and implemented
by the European Aviation Safety Agency - EASA*

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TE.GEN.00409-001



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Recap: States Action Plan



Recap

1. Structure of AP
2. Data
 - Fuel consumption data : FORM M
 - State has to Communicate and train Airlines to how to collect data by using FORM M
3. EBT can help
 - To Create Baseline
 - To Estimate Emission with Action& Emission Reduction
4. Mitigation Measures
 - Appropriate measures and with indicator (recommended)



State Action Plan's 5 Main Elements

1. **Contact Information** for the State Action Plan Focal Point
2. **Baseline Scenario (without action)** – including fuel consumption, CO2 emissions, and RTK
3. **Selected Measures** to mitigate CO2 emissions
4. **Expected Results** (estimated impact of selected mitigation measures on the baseline scenario) – including fuel consumption, CO2 emissions, and RTK
5. **Assistance Needs** (if needed)



STARTING POINT FOR SSCA

EMISSION DATA → FORM M

FOR STATE

- Communicate to the airline operators
- Capacity building/ training
- Set up the system
- Collect REPORT and submit to ICAO

FOR AIRLINE OPERATORS

- Collect Fuel uplift data each flight every light
- Record and keep record
- REPORT in form M
- Submit the State





Climate Change Implementation Elements for CAAT



Action Plan



Data Mgt System



Regulation



Cooperation



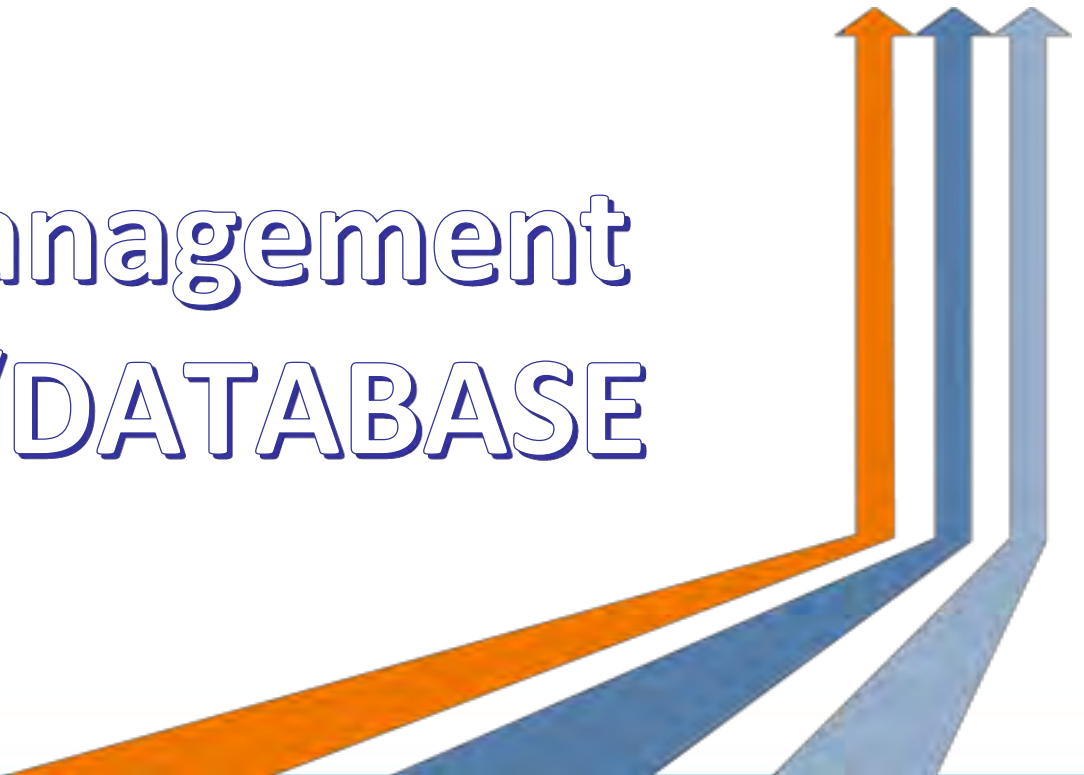
Capacity Building



- Action Plan (AP) is the first step for climate change but AP alone is not enough
- 4 more elements
 1. Data management system
 2. Regulation → MRV legal framework
 3. Capacity building
 4. Cooperation

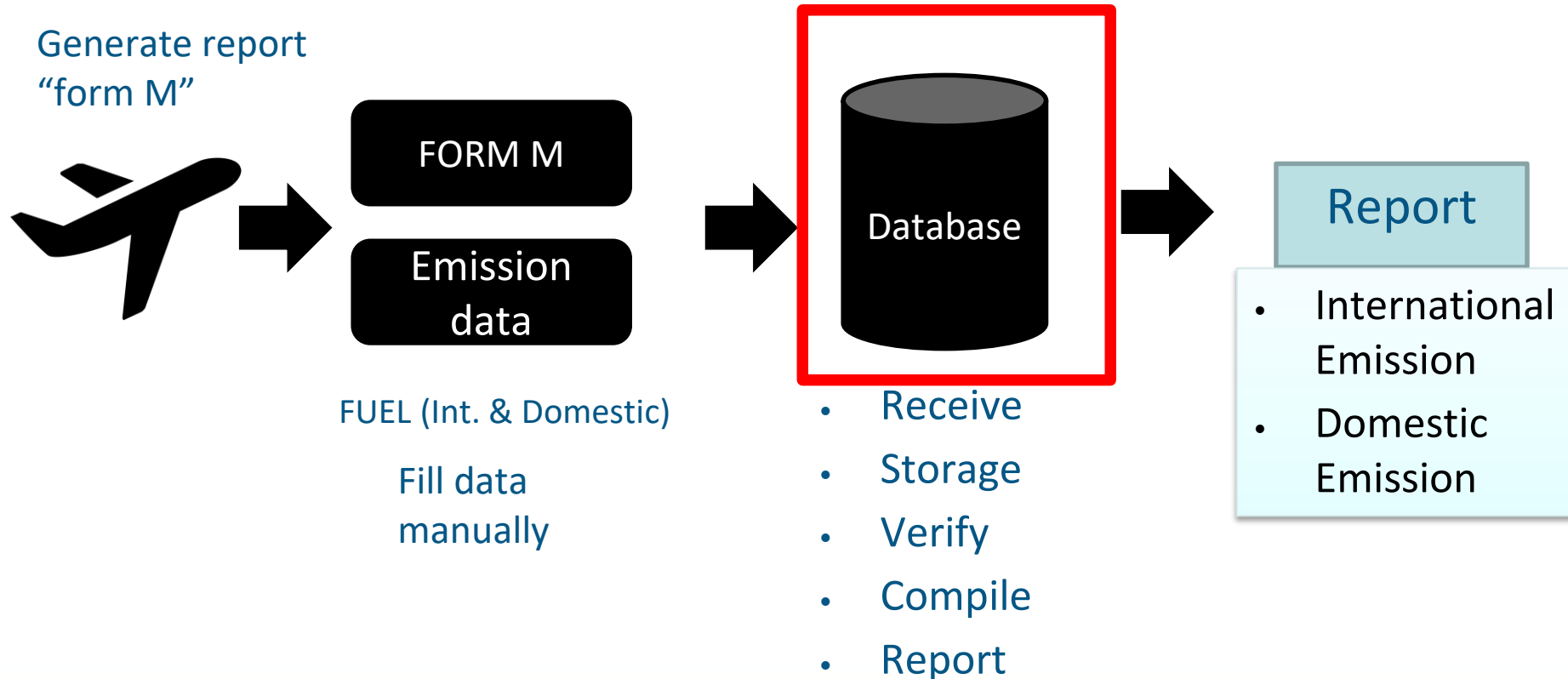


Data management system/DATABASE





Thailand's Reporting system on EMISSION data





Concept of EDMS (AEDS)

FUNCTIONS

- Data Collection
- Data storage
- Automated verification
- Automated reporting



On process for
improvement



EMISSION EVALUATION

International Flight(s)

Year:	2017	
Fuel consumption (Ton):		
ATK*1000 :		
RTK*1000 :		

Domestic Flight(s)

Fuel consumption (Ton):		
ATK*1000 :		
RTK*1000 :		

Submit

EMISSION DATA : submitted through EDMS (AEDS) database

- The authorized person from airline will fill data through EDMS web application
- INTERNATIONAL and DOMESTIC

START FROM BASIC



- NEVER FINISHED
- Keep improving
 - Plan for the up coming mission such as CORSIA
 - Other environmental issues





Capacity Building





Overall Objectives



- Building the capacity on CAAT's personnel
- Building the capacity on operators
- Share knowledge and information to each other
- Develop and gain knowledge in the Sector



Objectives of CAAT's capacity building program

- Skilled personnel
- Qualified Environmental Inspector
- Trainer and consultant for the industry (operator)
- Center or Sources of knowledge in Aviation





SECTORAL KNOWLEDGE TRANSFER MODEL



Sources of Knowledge
and Information

Receptor and
Transferrer

Receptor and
Transferrer



Capacity building → CAAT personnel



• Make Us Strong

- States Action Plan Workshop (ICAO Regional Seminar) 2017
- CORSIA Workshop (ICAO Regional Seminar) 2017
- Greenhouse gases management course (IAAA –Korea) 2018
- CORSIA Workshop (IATA Seminar) 2018
- EMP Workshop (IATA Seminar) 2018
- Aviation and The Environment (IATA Course) 2018
- Aircraft Noise (AIRSIGHT-Germany) 2018
- CORSIA (AIRBUS-VERTIS)2018
- Etc....

Capacity building → The Operators/Sector

- Make our OPERATORs strong





WORKSHOP organized during 2017-2018



ICAO statistic Workshop

MAR17



MRV Workshop

OCT17



CORSIA Workshop

MAY18



CORSIA Workshop

SEP17



Green Aviation Sector Workshop

DEC17



EMP Workshop

OCT18





ICAO statistic training

Objectives: To train the airline to be able to generate statistic report and submit to CAAT



- FORM A
- FORM C
- **FORM M**
- More than 20 Airlines participated
- CAAT could receive data from AUG 2017

March 2017



CORSIA Workshop

.2017







MRV Workshop





EMP Workshop organized by CAAT





SUCCESSFUL on CAPACITY BUILDING

Knowledge on ICAO Form

From None to 5, 7 and 11 (by 2018)
Airlines can report and submit FORM
M to CAAT

Knowledge on CORSIA

Airlines know what to do and they
do following CORSIA timeline



Knowledge on MRV

Airlines know when to
submit and the channel
to submit Report

Knowledge on Emission Reduction

Some Stakeholders showed
progression in emission reduction
and also keep implementing the
measures



Cooperation





COOPERATION

“MUCH better than working alone”





WORKING CLOSELY





WORKING CLOSELY





With Thai Airways







With Ministry of Energy and Thai Air Asia, Nok Air and Thai Lion Air

Energy Conservation Project



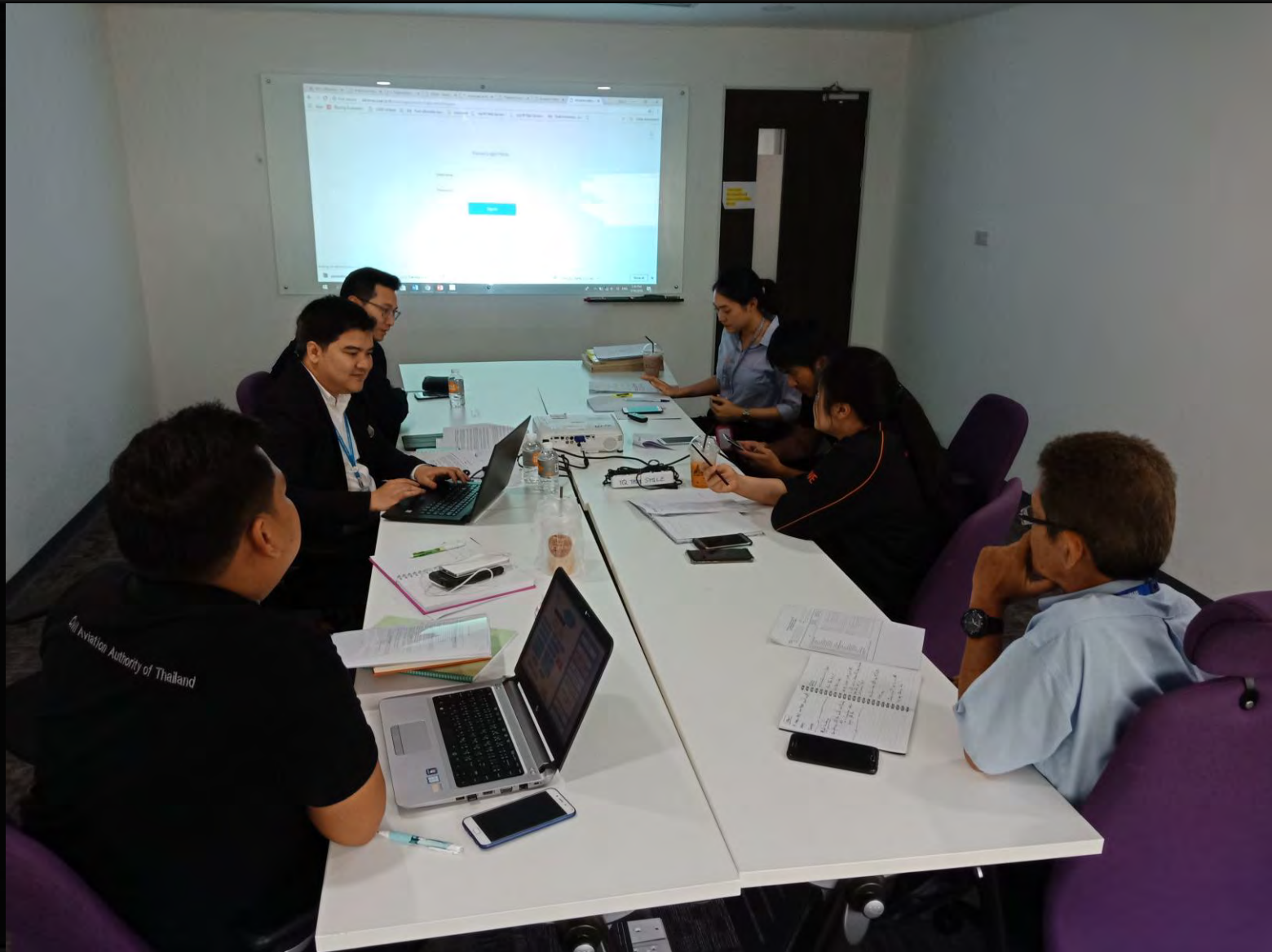


With Bangkok Airways





With Thai Smile Airways





With Thai Viet Jet





In DECEMBER 2017



- In cooperation with Governmental bodies , Operators and academic with MOU/agreement signed to create green aviation Sector
- CAAT, ONEP, Thai Airways, Bangkok Airways, Thai Air Asia, Rangsit University





The First meeting among CAAT, DGCA (Indonesia) and DCA (Malaysia) on CORSIA preparation for Implementation
In OCTOBER 2017





The First meeting between CAAT and DGCA (Indonesia) for
Environmental protection and CORSIA
In DECEMBER 2017



**THANK YOU FOR YOUR KIND
ATTENTION**

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THAILAND's Aviation Sector Monitoring, Reporting and Verification (MRV) Systems

Pasavi RATCHAPONGSIRIKUL

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Recap : DAY2 –Action Plan

Recap

- ❑ Action Plan alone is not enough
- ❑ The enhancing programs are required (as per CAAT's experience)
 - Capacity building
 - Data system management
 - Cooperation
 - Regulations
 -MRV.....



MRV system

Data management and Regulation





Climate Change Implementation Elements for CAAT



Action Plan



Data Mgt System



Regulation



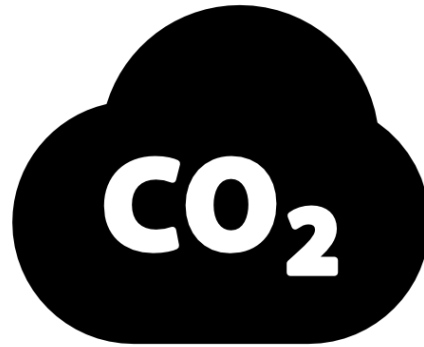
Cooperation



Capacity Building



To deal with Climate Change.....



We NEED ACCURATE DATA



- Because we need to declare and claim the NUMBER to others
- DATA/NUMBER has to be reliable
- This is the reason we set up the SYSTEM to ensure in good quality of data

Monitoring
Reporting
Verification

MRV



MRV for TH-Aviation Sector



Domestic

- Domestic Emission report to MONRE (National UNFCCC Focal point)



International

- **ICAO** Air transport Statistic (FORM M)
- **ICAO CORSIA**



1. MRV for TH-Aviation Sector/ DOMESTIC



Domestic

- Domestic Emission report to MONRE (National UNFCCC Focal point)



International

- ICAO Air transport Statistic (FORM M)
- ICAO CORSIA



Why Thailand has to reduce GHG emission?



- Thailand pledged a 20 to 25 percent reduction in its emission of greenhouse gases by 2030

On 30 November 2015, at the 21st Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21).



The CONSEQUENCEs of Paris Agreement to THAILAND

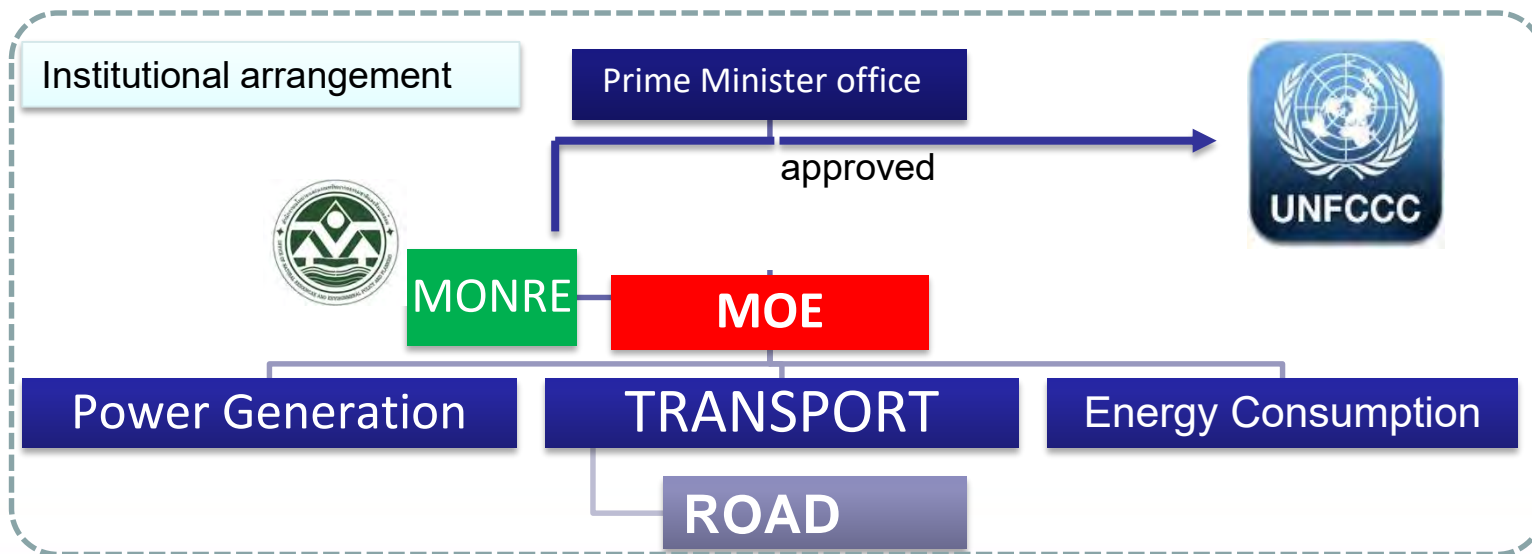
- Roadmap of mitigation actions
- Sectoral action plan drafted
- MRV guideline for each sector
- AVIATION is a priority subsector to reach transport target as per next NDC
 - Aviation is under CAAT's responsibility



THAILAND's DOMESTIC AVIATION

- In the PAST

- Domestic Aviation Fuel Data was NOT considered
- Ministry of Energy (MOE) collected the quantity of fuel sold for statistic purpose (Energy Statistic Report)





THAILAND'S DOMESTIC AVIATION

• 2.1) DOMESTIC AVIATION EMISSION

- In the past we report aviation emission by the quantity of fuel sold
- **“FUEL SOLD”**
 - QUANTITY of FUEL that fuel suppliers sell for airplanes while they are in Thailand
 - For International flight or Domestic Flight?
 - For Thailand's Airplane operators or Non-Thailand's Airplane Operator?
 - How can we claim that is Emission in the THAILAND's territory (boundary)?
 - Double counting?

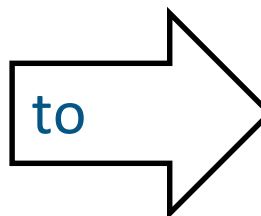


FUEL SOLD vs FUEL CONSUMPTION

- FUEL SOLD



Supplier



- FUEL CONSUMPTION





THAILAND'S DOMESTIC AVIATION

- From our investigation
 - QA/QC by MOE is good (*Fuel sold data from suppliers*)
 - But **not** reflect Domestic Flight emission or Fuel used in Domestic Flight
 - In the Past, DCA estimated aviation fuel used in domestic flight
 - The discrepancy between the data of MOE and DCA
 - Data from MOE is for statistic purpose and not aimed at tracking emissions
 - FUEL SOLD is NOT Emissions



THAILAND'S DOMESTIC AVIATION

- CAAT determined the methodology
- CAAT takes care Fuel consumption/ Emission data of Aviation Sector (we have both DOM & INTER data)
- CAAT started collecting “**Domestic Fuel Consumption**” from year 2017
 - **FROM.....**
 - Airplane Operators registered with CAAT (THAI AOC)
 - Domestic flights
 - **By.....**
 - CAAT Developed “EDMS(AEDS)” database and Standardized templates
 - First started with International and then with Domestic
 - CAAT communicated the airlines through workshop, meeting and share instructions on Website
 - About 10 Airlines submitted data via CAAT's database
 - International and Domestic Data



THAILAND'S DOMESTIC AVIATION

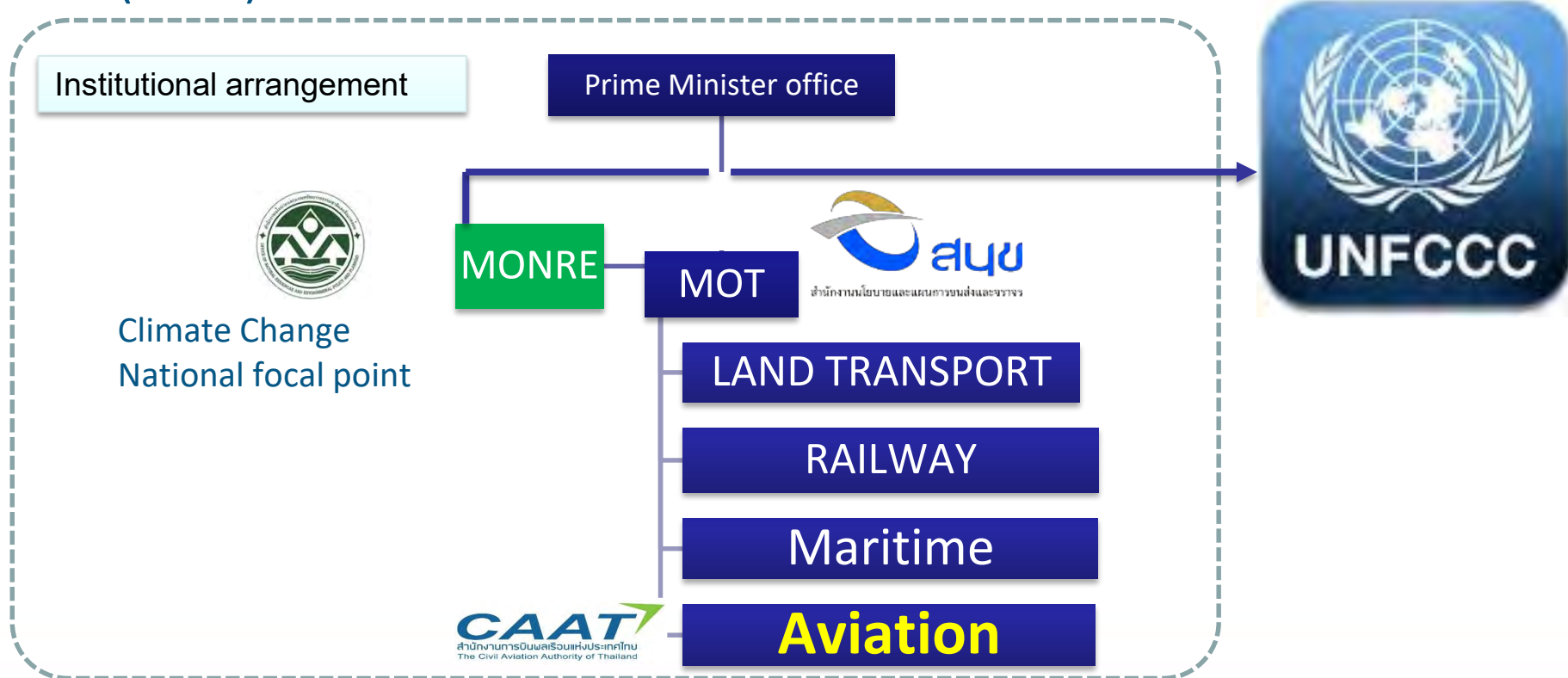
- By agreed with
 - Ministry of Environment (MONRE/ONEP) and
 - Ministry of Transport (MOT/OTP)
- To Collect and Report “Activity Data” through the agreed template
 - Fuel Consumption data of Domestic Aviation of Thailand
 - Web Application will be used for airlines to submit data to CAAT
- To Submit Report to OTP/MOT (starting from 2017 data) in 2018
- OTP submit the report to ONEP/MONRE through National Database “TGIES”
- ONEP(MONRE) will report as per international deadlines (NDC, BUR and NC)



THAILAND's DOMESTIC AVIATION

PRESENT

- Domestic Aviation Emission is reported to Ministry of Natural Resources and Environment (MONRE) by Ministry of Transport (MOT)





MRV for TH-domestic aviation



Check and Report(MONRE)

Check and Report (MOT)

Magnitude Check of data
Compile data from airlines
and report

A/L report fuel consumption
data(domestic)



2. MRV for TH-Aviation Sector/ INTERNATIONAL



Domestic

- Domestic Emission reported MONRE



International

- **ICAO** Air transport Statistic (FORM M)
- **ICAO CORSIA**



2 INTERNATIONAL AVIATION EMISSION

2.1 ICAO FORM M*

- FORM M is related to Fuel consumption and Emission particularly INTERNATIONAL AVIATION
- After end of the year, Airlines have to report form M within March next year



** As we are focusing to Emission /fuel consumption data*



MRV for INTERNATIONAL / ICAO FORMs



Verify data
and report

A/L report ICAO FORMs
(statistic)



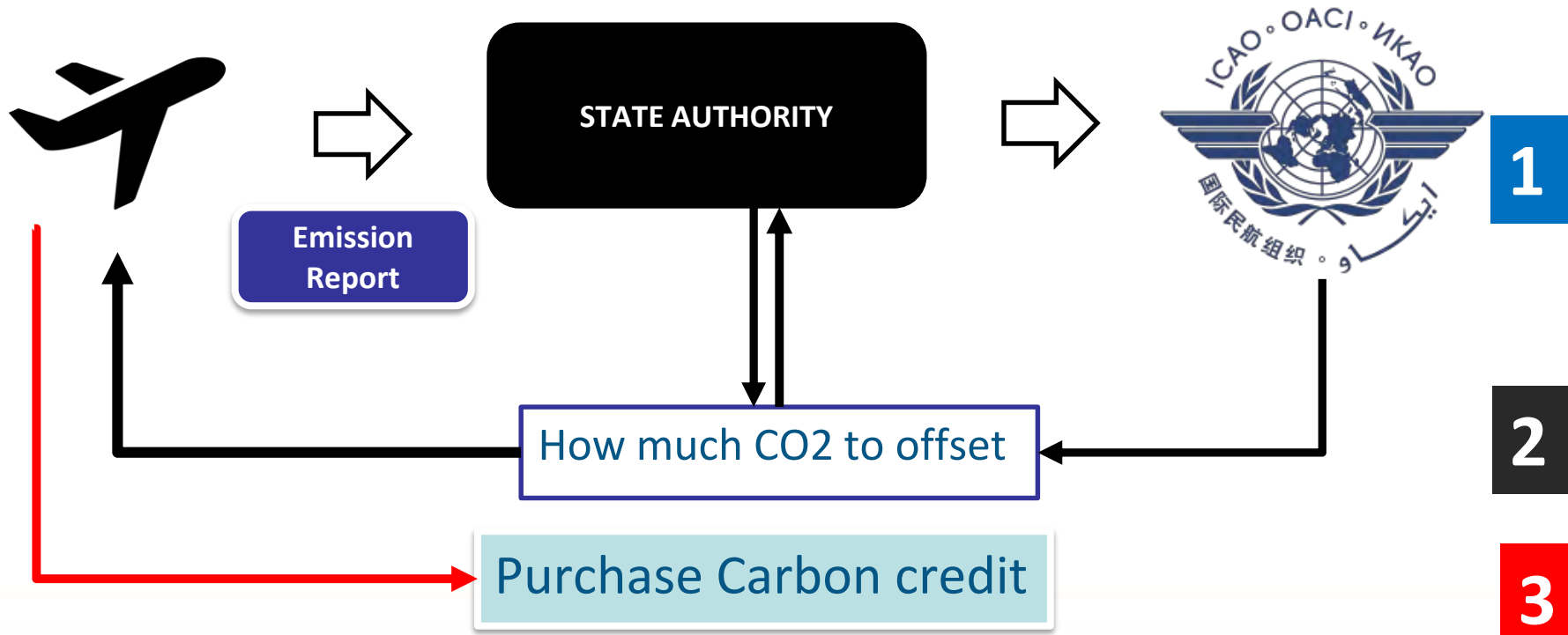
2.2) ICAO 's CORSIA

- Carbon Offsetting and Reduction Scheme for International Aviation
- An emission mitigation approach for the global airline industry, developed by ICAO.
- CORSIA addresses emissions from international air travel.
- It is a market-based scheme by which airlines compensate their international flights CO2 emissions by purchasing carbon offsets.
- A carbon offset is a credit for carbon reductions made by one party that can be purchased to compensate the emissions generated by another party



CORSIA principle

- The Airlines of the State participating CORSIA have to REPORT their emission and compensate their emissions by purchasing carbon offsets





International Aviation **Baseline Emission** will be evaluated from 2019 to 2020. Therefore,.....

All The States have to create

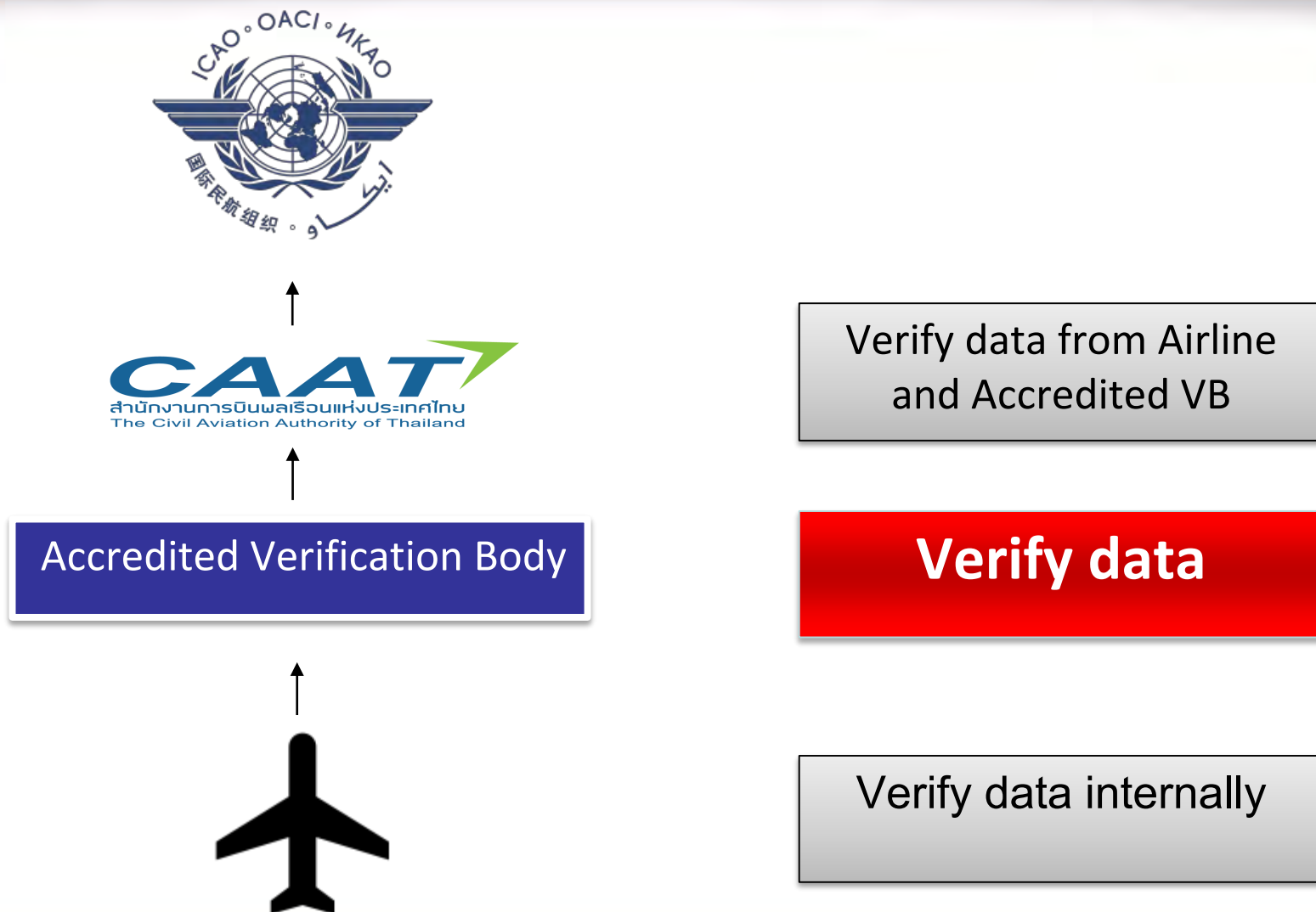
- MRV legal framework

All Airplane Operators flying international flight have to

- Communicate, agree and submit **Emission Monitoring Plan (EMP)** to State by Feb2019



MRV for INTERNATIONAL / ICAO CORSIA





CORSIA timeline

- from 2019 to 2020 Every State and Every Airlines operating International flight have to report Fuel Consumption
- From 2021 , The airline registered with the States voluntary to participate CORSIA have to report their Fuel Consumption
- Offsetting of their emission will be started after 2021



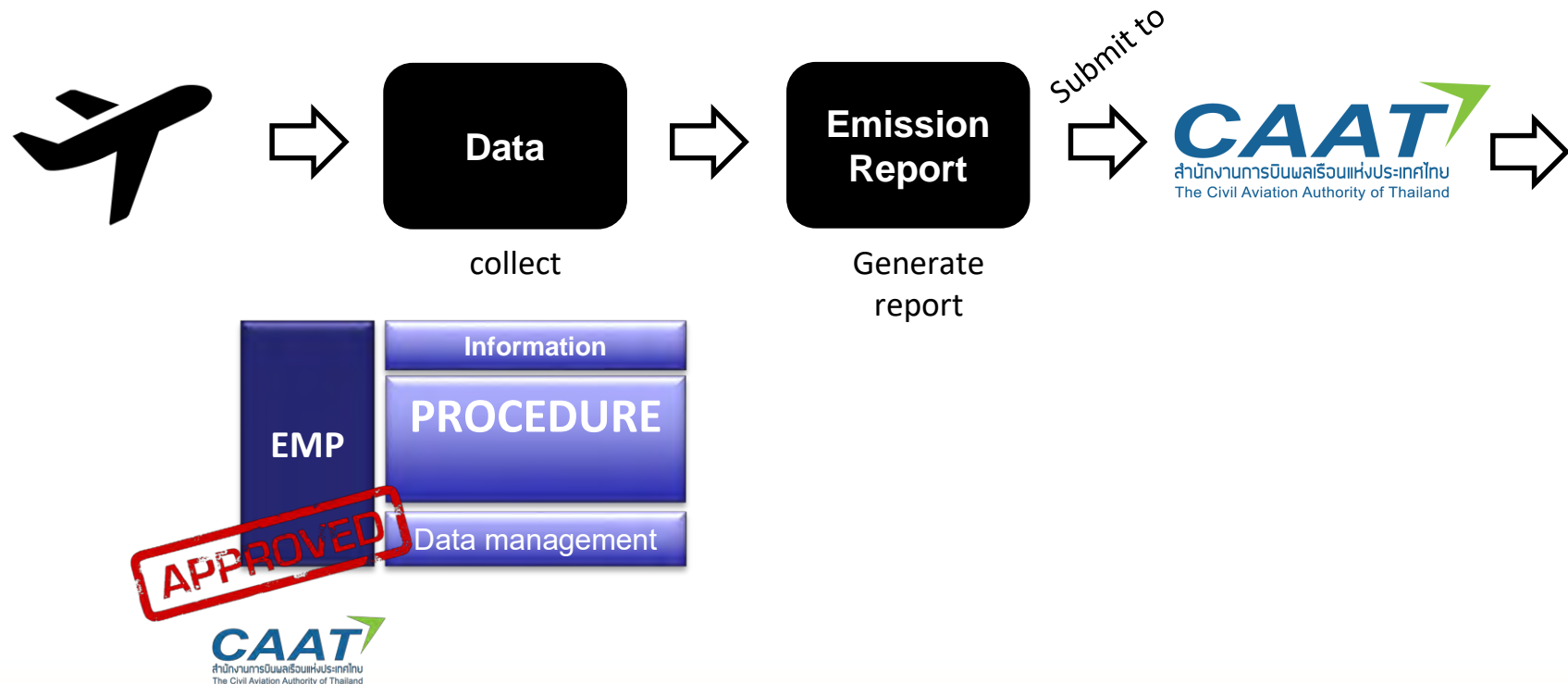
Challenges for Aviation's MRV system in Thailand

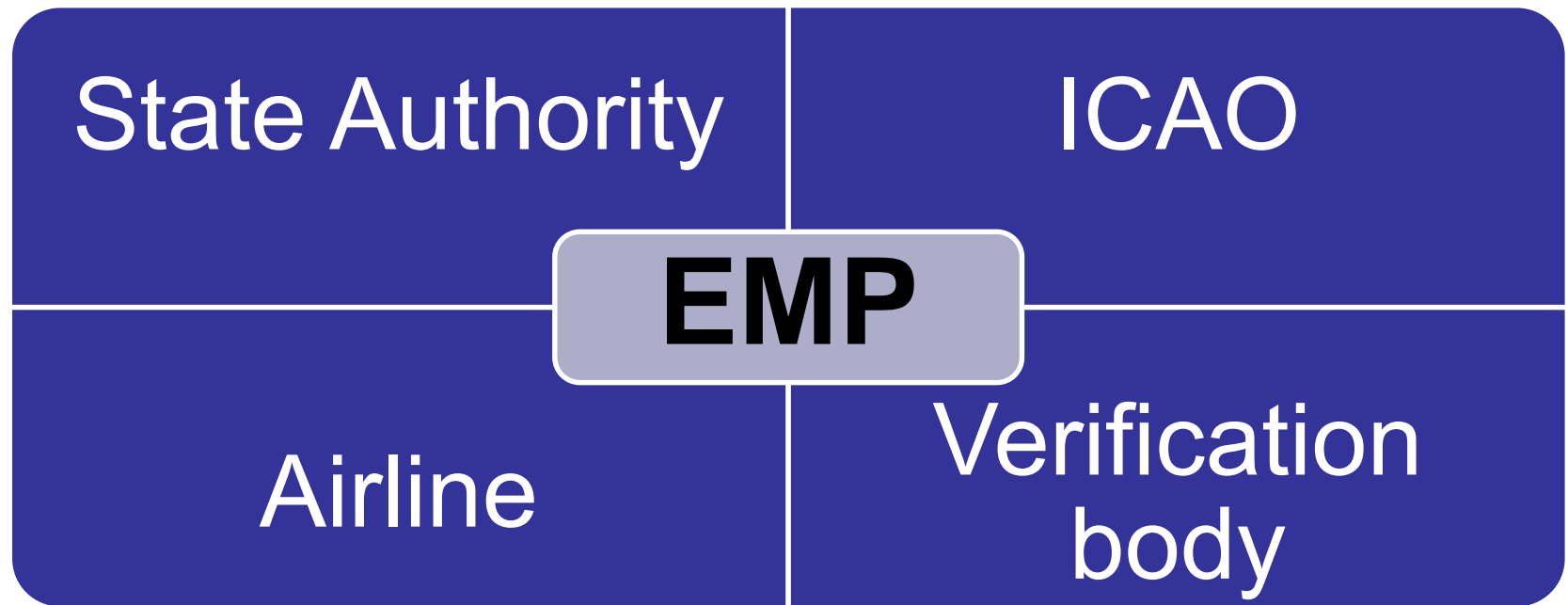
- Voluntary Basis-----→ Mandatory basis
MRV REGULATION is NEEDED urgently
- Domestic : Fuel data/ emission data will be included in the National report
 - More Communication among governmental bodies is needed
- International:
 - Some small airlines, non schedule , Charter airlines are not ready yet
-----→ Training
- CORSIA:
 - Timeline is very tight, starting in 2019
 - **EMP has to be submit to State before FEB2019**
 - CORSIA Database (registry) needs to be develop in the near future



CORSIA : EMP

- EMP = Emissions Monitoring Plan







EMP: Emissions Monitoring Plan for CORSIA

- EMP = Emissions Monitoring Plan
- Procedure agreed by Operator and approved by State
 - Methodology of Fuel data monitoring
 - How to manage emission data
- **EMP Template (EXCEL SHEET recommended by ICAO)**
 - Identification
 - Fleet and operation data
 - Monitoring method
 - Data management



Identification

2 AEROPLANE OPERATOR IDENTIFICATION AND DESCRIPTION OF ACTIVITIES

(Annex 16, Volume IV, Appendix 4, 2.1)

a) Name of the aeroplane operator

Please enter the name of the aeroplane operator. This name should be the legal entity engaged in the aeroplane operation, or the legal entity seeking to be the single entity for the CORSIA administration under a parent-subsidiary arrangement.

b) Address of the aeroplane operator

Please enter the address of the aeroplane operator.

Address line:	
City:	
State/Province/Region:	
Postcode/ZIP:	
Country:	

- General Information
- Legal representative
- AOC number



FLEET and OPERATIONS DATA

3 FLEET AND OPERATIONS DATA

(Annex 16, Volume IV, Appendix 4, 2.2)

a) Fleet declaration

List all aeroplane types, including owned aeroplanes as well as leased aeroplanes, with an MTOM greater than 5 700 kg (12 566 lbs) operated on international flights, as defined in Annex 16, Volume IV, Part II, Chapter 1, 1.1.2, and Chapter 2, 2.1, at the time of submission of the Emissions Monitoring Plan as specified in Doc 8643 — Aircraft Type Designators.

Additional information about Doc 8643 — Aircraft Type Designators can be found at:

<http://www.icao.int/publications/DOC8643/Pages/Search.aspx>

No.	ICAO type designator	Fuel type	Number of aeroplanes
1			
2			
3			
4			
5			
6			
7			
8			

No.	ICAO type designator	Fuel type	Number of aeroplanes
21			
22			
23			
24			
25			
26			
27			
28			

- Aircraft Fleet
- Flight (origin and destination)



FUEL USE MONITORING METHODS

Fuel Use Monitoring Methods

Please provide information on the use of different monitoring methods per sub fleet (by ICAO aircraft type designator).

Monitoring method	Applicable for the following sub-fleets of aeroplanes (by ICAO aircraft type designator)	2019-2020 period	2021-2035 period
Method A			
Method B			
Block-off / Block-on			
Fuel Uplift			
Fuel Allocation with Block Hour			



5. DATA MANAGEMENT, DATA FLOW, CONTROL SYSTEM, RISK ANALYSIS AND DATA GAPS

(Annex 16, Volume IV, Appendix 4, 2.4)

a) Description of data management

Please provide a description of each step in the data flow and data processing, including controls to assure data quality, beginning with the source data up to the Emissions Report. Please reference the responsible departments. Please attach a data flow chart to the Emissions Monitoring Plan summarizing the systems used to record, store and control the quality of data associated with the monitoring and reporting of emissions.

- Data Flow
- Data Control System
- Data Gap and how to fix (2 nd source?)

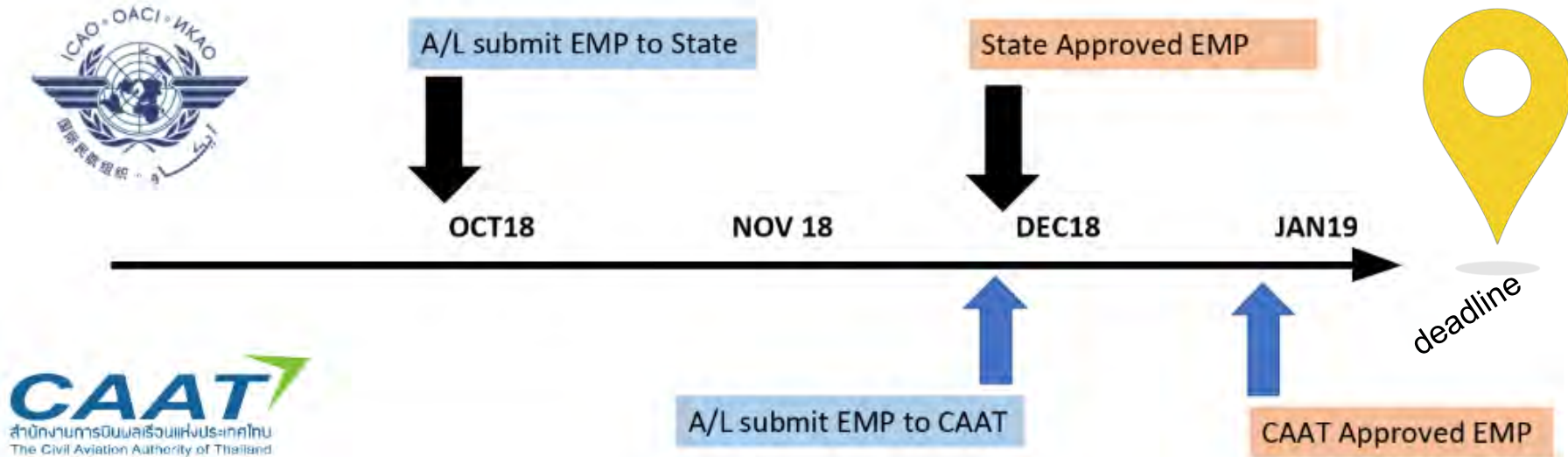


EMP: Emission Monitoring Plan for CORSIA

- State can whether Agree or Modify the original EMP
 - CAAT use the original template
- CAAT Communicates and trained the airline about “EMP”
 - Shared by email and on Website
 - How to fill the template
 - Guide for the methodology to be used
- CAAT decided to fix deadline in advance in comparison the ICAO’s deadline (FEB2019)



Timeline : EMP submission



ICAO 's deadline for the airlines to submit EMP to State is FEB 2019



CHALLENGEs on EMP

- One point is complicated to deal with is Data management
 - Data Flow
 - Data control (QA/QC)
 - Data Gap (how to fix)
- Solutions: CAPACITY BUILDING
 - Training
 - Demonstration from the capable airlines
 - Group discussion/meeting



EMP Workshop organized by CAAT





CAAT& airlines meeting





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THANK YOU

for your kind attention

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