



# Regional Cooperation on Severe Air Pollution in Northeast Asia

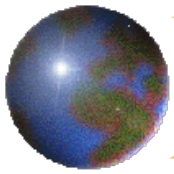
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Mark Elder

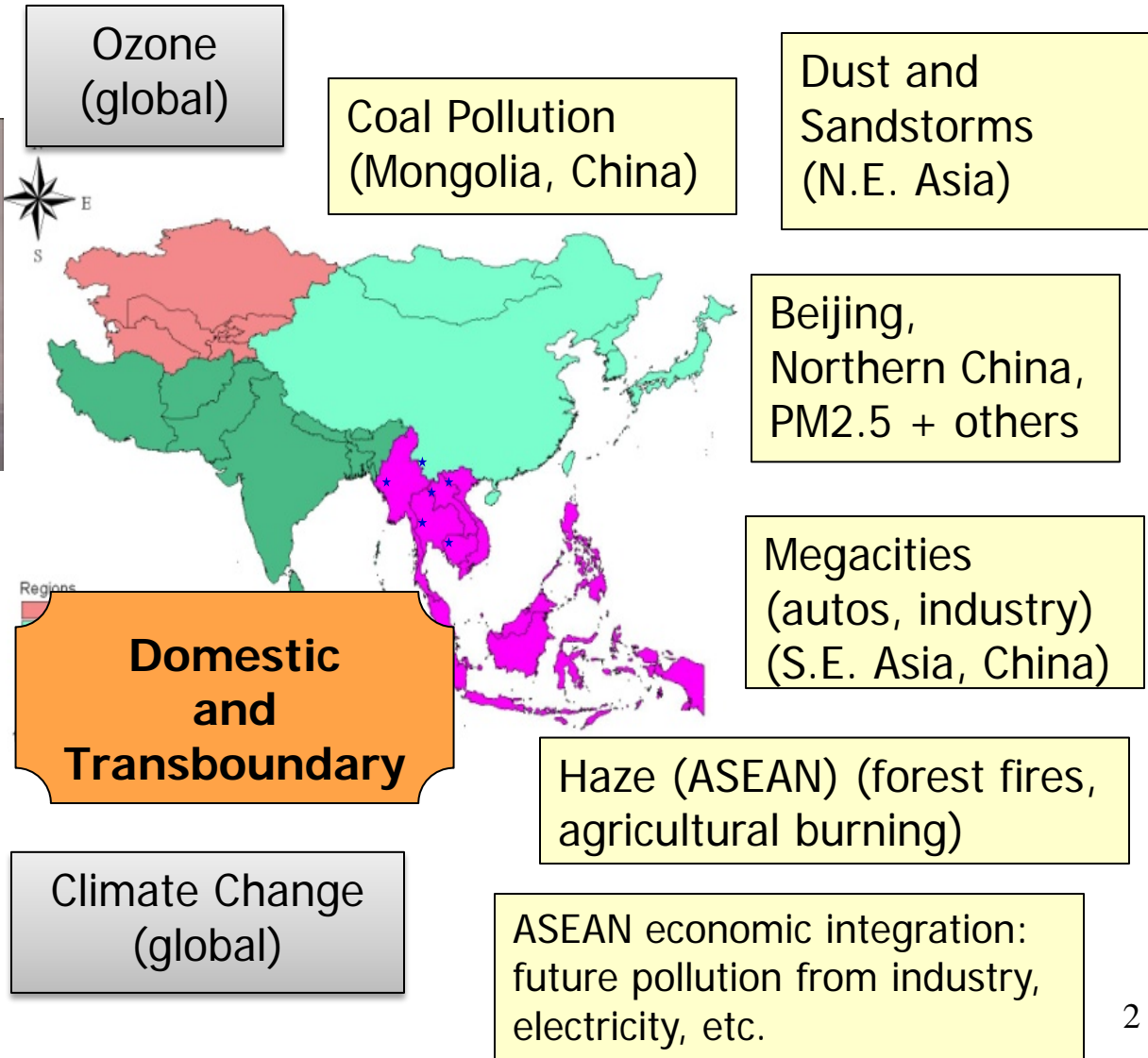
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Incheon National University, Incheon City, Korea



# Major Air Pollution Problems in East Asia



- Wide range of problems
  - Getting more complex
  - Getting worse
  - Need cooperation
- (Countries cannot solve by their own efforts)

# Addressing Severe Air Pollution: China

- China already demonstrated effectiveness of short term control measures
  - Beijing Olympics, Shanghai Expo, Guangzhou Asian Games
  - Extraordinary measures: factory shutdowns, driving restrictions, etc.
  - New plan for upcoming APEC meeting
- High economic costs => therefore only short term
- New policies for air pollution emergency forecasting, warnings
- Many new air pollution policies in China
  - Stronger targets, more pollutants, monitoring, public release of data
  - Integrated into Five year plans (includes economic measures to modernize environmental technology and eliminate backwards industrial structure)
  - Officials' promotions linked to environment
  - Stronger EIA (can block new projects)
  - Regional management (domestic transboundary pollution), higher targets for designated regions
- Key is implementation
  - Challenges: capacity constraints, resistance to implementation
- How can international cooperation help? Capacity development?

# Addressing Air Pollution in Other Developing Countries

- Long term measures (structural)(take longer)
  - Renewable energy
  - Energy efficiency
  - End of pipe measures for power plants
  - Stronger auto standards (emissions, efficiency, fuel standards)
  - Stronger emissions standards for stationary sources
  - Stronger ambient standards
- Basic monitoring may need to be expanded
- Multipollutant Multieffect modelling is needed to enhance effectiveness and cost effectiveness
- Many basic capacities are lacking
  - Human resources, monitoring equipment, data (emissions inventories, etc.)
- Asian developing countries need help through international cooperation. What is the best way?

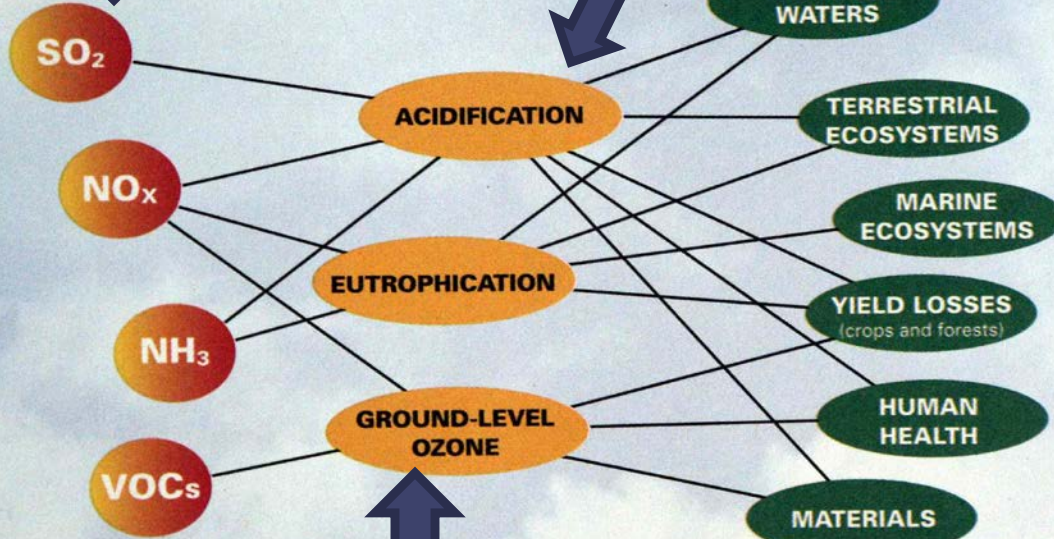
# Modeling/ Multipollutant Multieffect Approach

(Key example: Gothenburg Protocol of the  
Convention on Long Range Transboundary Air  
Pollution [LRTAP] in Europe)

# Concept map of the Multi-pollutant Multi-effect (MPME) approach in the Gothenburg Protocol of LRTAP

Multiple (Primary) Pollutants

Multiple Effects



Source: LRTAP Secretariat 1999, revised 2002

Secondary Pollutant

## MPME Elements

- A. System of Scientific Analysis
- B. Target Concept & Rationale
- C. Recommendations for targets

## Inputs:

- Monitoring data
- Emissions inventories

## Integrated Modeling (RAINS => GAINS) / EMEP Monitoring

- Interactions among pollutants
- Effects of pollutants
- Reduction technologies
- Reduction costs
- Transboundary movement

## RESULTS: OPTIMIZED, DIFFERENTIATED EMISSION REDUCTION TARGETS

- Based on effects
- Cost optimized
- Differentiated by country

# Major Advantages of MPME (& GAINS-type Models)

- Maximize effectiveness of reduction measures
  - (especially secondary pollutants which are formed in the atmosphere and not emitted directly)
- Maximize cost effectiveness of reduction measures
- Different countries have different targets
- More flexibility for reduction options
- Countries can't achieve reductions on their own

Targets can be set without modeling or MPME (or analysis of transboundary movement), but reduction measures would cost more and be less effective.

Not just about transboundary movement

East Asian countries should be interested in cost effectiveness and differentiated targets.

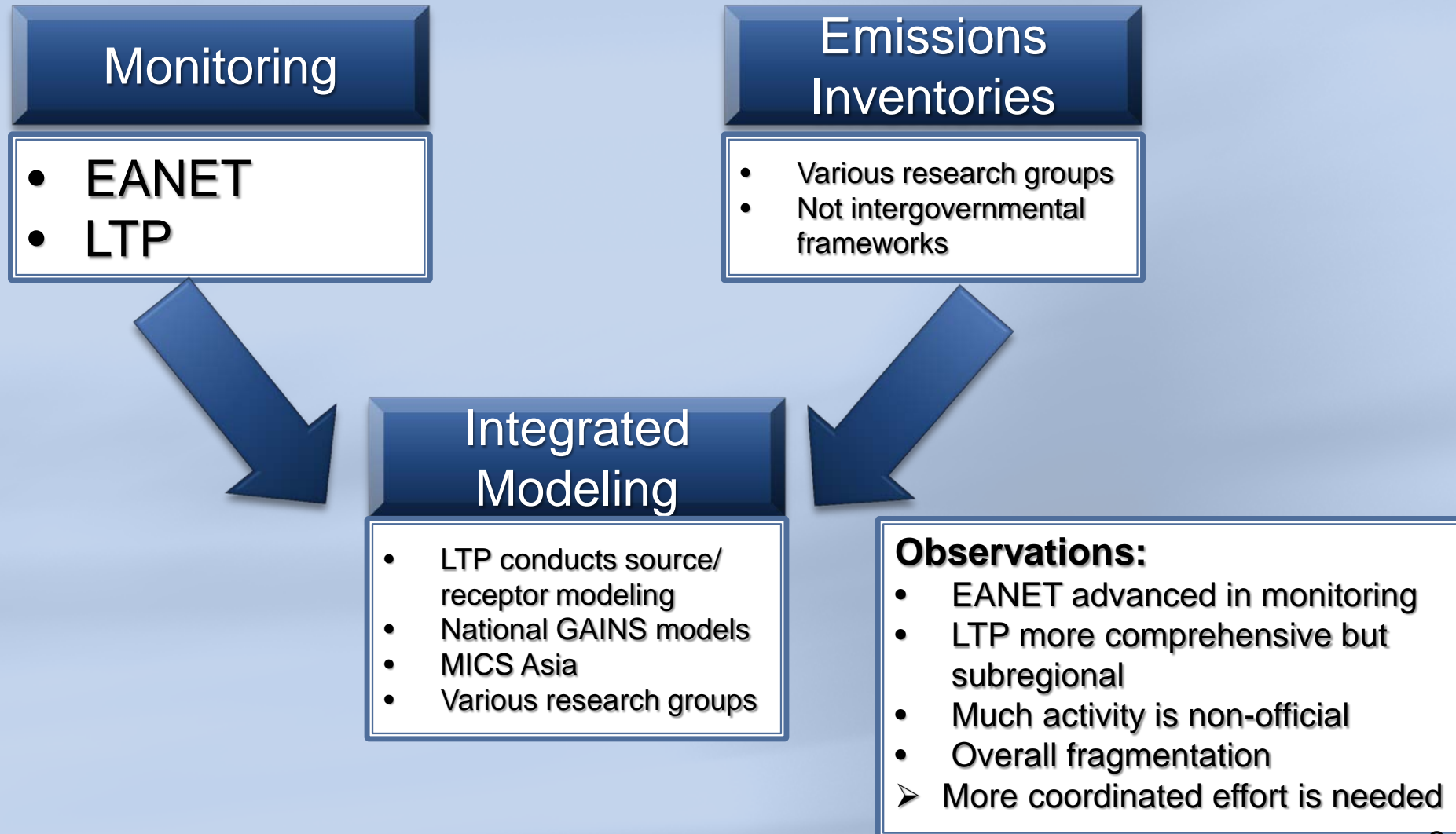
# Northeast Asian Countries Already Moving in MPME Direction (Domestically)

| Country | Direction  |
|---------|--|
| China   | <ul style="list-style-type: none"><li>➤ China GAINS (not endorsed by the government)</li><li>➤ Regional management system in 12<sup>th</sup> FYP =&gt; Future domestic LRTAP?</li><li>➤ Beijing Olympics control system: Mini-temporary domestic LRTAP</li><li>➤ Government is supporting related research</li></ul> |
| Korea   | <ul style="list-style-type: none"><li>➤ Korean GAINS under development</li><li>➤ Related research underway</li></ul>   |
| Japan   | <ul style="list-style-type: none"><li>➤ Developing systems similar to GAINS</li><li>➤ Related research underway</li></ul>  |
| Russia  | <ul style="list-style-type: none"><li>➤ Member of LRTAP</li><li>➤ Promoting NEA LRTAP-type framework in NEASPEC</li></ul>  |





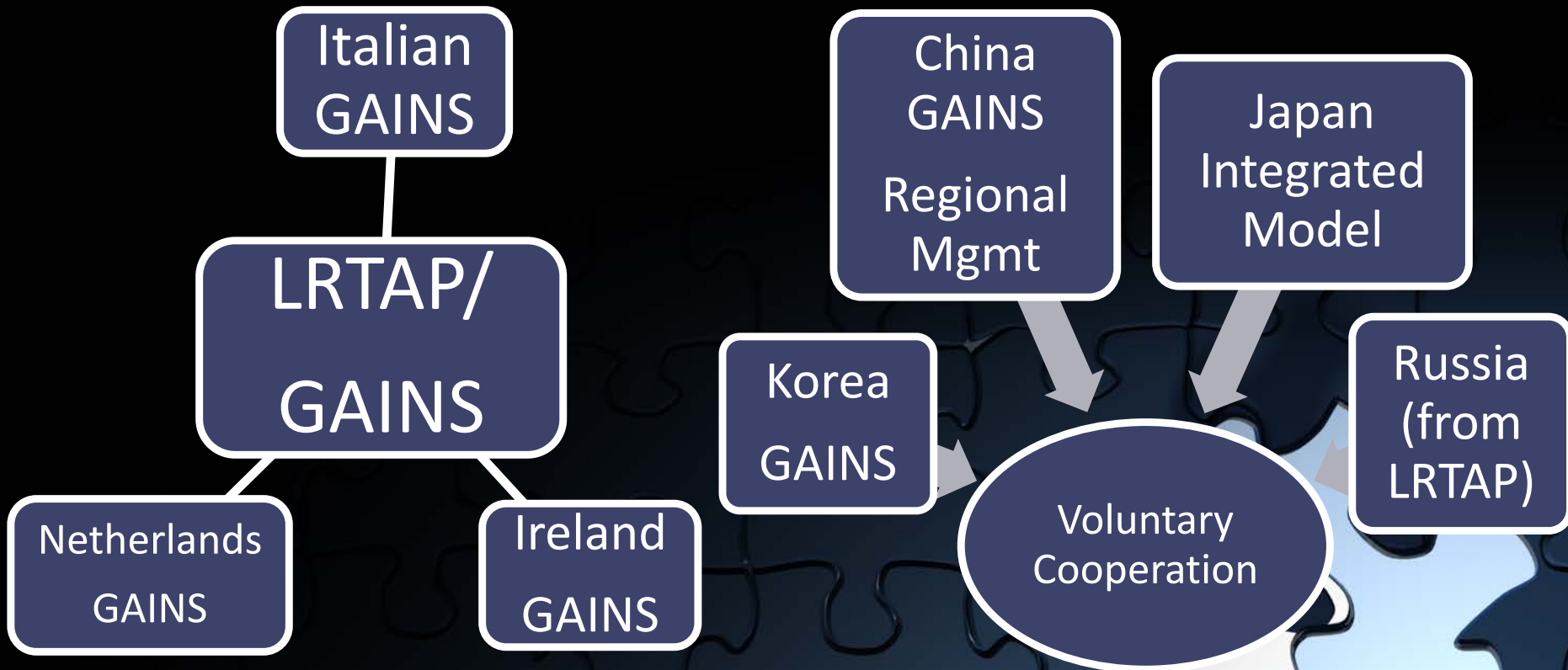
# Current MPME Building Blocks in Existing East Asian Cooperation Frameworks



# MPME Cooperation Images

LRTAP: TOP DOWN

EAST ASIA: BOTTOM UP?



- Only a few countries have national GAINS
- National models based on central one

- 4 NEA countries developing models
- Models have significant differences
- Maybe benefits from cooperation

# Capacity Building Is Key

Capacity building is key for developing countries

For all aspects, not just MPME

- Human resources
- Scientific capacity
- Monitoring capacity
- Administrative capacity

EA cooperation frameworks make efforts, but not sufficient; insufficient resources

**Important role for international cooperation**

**LRTAP**

- Capacity building is a major focus; significant funds
- Focus on eastern and southern Europe
- European Environment Agency also helps

# Regional Cooperation: Existing Frameworks

# Now is Good Timing: Positive Trends for Regional Cooperation

## Positive Trends

- Converging perceptions of severity and priority air pollutants
- Stronger domestic policies in many countries (including China, Japan, Korea)
- Greater recognition of transboundary aspects of air pollution
- Increased scientific capacity in the Asian region
- Greater interest and activity in existing cooperation frameworks

## Challenges

- Variety of similar initiatives and frameworks
- Differences in how to strengthen existing frameworks
- Some differences of interest in focus

# Selected Existing Regional Air Pollution Cooperation Frameworks in East Asia

|             |  |  |
|-------------|--|--|
| CCAC        | Climate and Clean Air Coalition <ul style="list-style-type: none"> <li>• Global (only Japan &amp; S. Korea in E. Asia)</li> </ul>                  | <ul style="list-style-type: none"> <li>• Climate/SLCP</li> <li>• Multistakeholder</li> </ul>                                       |
| ABC         | Atmospheric Brown Clouds <ul style="list-style-type: none"> <li>• Global/regional</li> </ul>   | <ul style="list-style-type: none"> <li>• Includes air+climate</li> </ul>   |
| EANET       | Acid Deposition Monitoring Network in East Asia <ul style="list-style-type: none"> <li>• Northeast + Southeast Asia</li> </ul>                     | <ul style="list-style-type: none"> <li>• Mainly monitoring</li> <li>• Narrow scope</li> <li>• Intergovernmental</li> </ul>         |
| Joint Forum | Joint Forum on the Atmospheric Environment in Asia and the Pacific <ul style="list-style-type: none"> <li>• Asia-wide</li> </ul>                   | <ul style="list-style-type: none"> <li>• Network of networks (UNEP)</li> </ul>   |
| TEMM        | Tripartite Environment Ministers Meeting <ul style="list-style-type: none"> <li>• Northeast Asia (China, Japan, Korea)</li> </ul>                  | <ul style="list-style-type: none"> <li>• Intergovernmental</li> <li>• Regular meeting</li> <li>• Collection of projects</li> </ul> |
| LTP         | Long Range Transboundary Air Pollutants in Northeast Asia <ul style="list-style-type: none"> <li>• Northeast Asia (China, Japan, Korea)</li> </ul> | <ul style="list-style-type: none"> <li>• Research project</li> <li>• Broader scope (but not climate)</li> </ul>                    |
| NEASPEC     | Northeast Asia Program on Environmental Cooperation <ul style="list-style-type: none"> <li>• Northeast Asia (6 countries)</li> </ul>               | <ul style="list-style-type: none"> <li>• Secretariat: ESCAP-ENEA</li> <li>• Intergovernmental</li> <li>• Project based</li> </ul>  |
| CAA         | Clean Air Asia (formerly CAI-Asia) <ul style="list-style-type: none"> <li>• Asia-wide</li> </ul>   | <ul style="list-style-type: none"> <li>• Multistakeholder partnership</li> </ul>   |

# Recent Developments in Existing Frameworks

| Framework   | Recent Developments   |
|-------------|---|
| CCAC        | <ul style="list-style-type: none"> <li>• New Asian members include Bangladesh, Mongolia, Maldives</li> <li>• Existing Asian members: Japan and Korea</li> </ul>             |
| ABC         | <ul style="list-style-type: none"> <li>• Discussions with new Japanese research project to discuss the future framework.</li> </ul>   |
| EANET       | <ul style="list-style-type: none"> <li>• Planning to expand the scope</li> </ul>  |
| Joint Forum | <ul style="list-style-type: none"> <li>• UNEP proposes to revitalize and expand</li> </ul>  |
| TEMM        | <ul style="list-style-type: none"> <li>• First air pollution policy dialogue March 2014</li> <li>• Air pollution as first priority area in next TEMM Action Plan</li> </ul> |
| LTP         | <ul style="list-style-type: none"> <li>• Developing Fourth Stage Plan</li> </ul>  |
| NEASPEC     | <ul style="list-style-type: none"> <li>• Development of the Technical and Policy Frameworks for Transboundary Air Pollution Assessment (Russian initiative)</li> </ul>      |
| CAA         | <ul style="list-style-type: none"> <li>• Focus on city level actions</li> </ul>   |
| ASEAN Haze  | <ul style="list-style-type: none"> <li>• Indonesia is planning to ratify</li> </ul>   |

# Regional Cooperation: Recommendations



# Main Messages for Regional Cooperation on Air Pollution

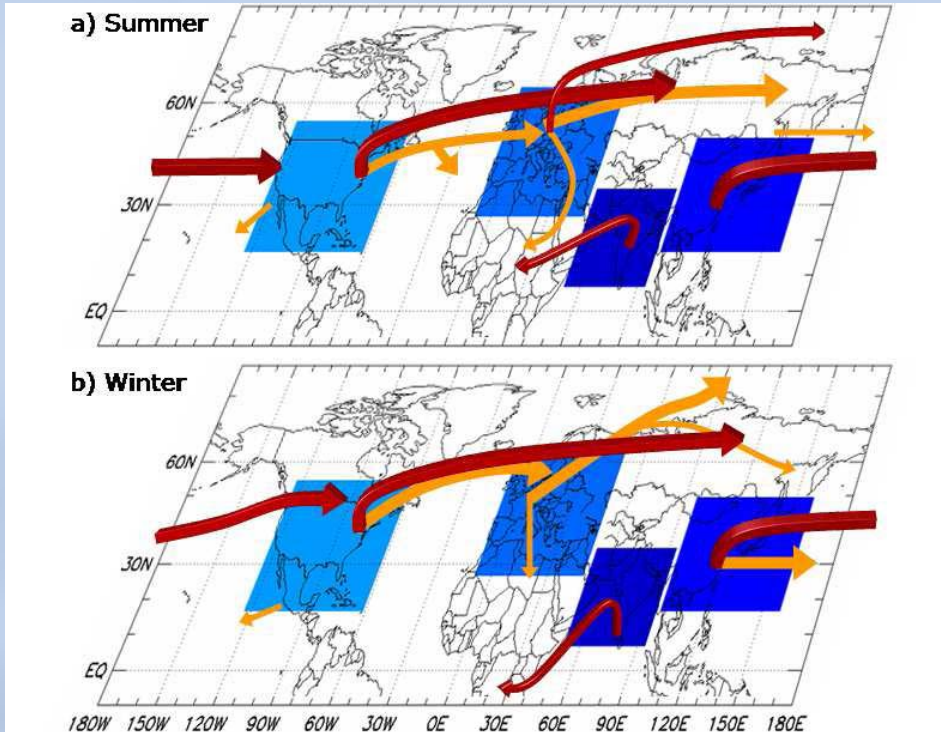
1. Geographic scope of cooperation should be broader: East Asia or Asia (not just Northeast Asia – ultimately should be global)
2. Joint Forum can facilitate collaboration and coordination among existing frameworks.
3. Consider merging existing frameworks (LTP-EANET or LTP-NEASPEC).
4. Air pollution and climate (esp. SLCP) should be linked (increased cost effectiveness, modeling effectiveness)
5. Multi-pollutant multi-effect approach (modeling) could be a focus of regional cooperation.
  - Legally binding treaty might not be necessary
  - Also focus on capacity building
6. Establish an Asian Science Panel on Air Quality (ASPAQ)
7. Sub-regional frameworks (e.g. in Northeast Asia) could focus on emissions inventories, capacity building etc.

# Geographic Scope: Broader is Better

- Many air pollutants are regional or global in scope (transboundary)=> countries cannot solve problems through their own efforts
  - PM, ozone
  - Atmospheric brown clouds
- Monitoring works better with a broader scope
  - Can be more standardized
- Modeling works better with a broader scope
  - Multi-pollutant, multi-effect approach is more effective
  - Better analysis of transboundary movement
- Need to link climate and air pollution
  - SLCPs
  - Co-benefits
  - Greater cost effectiveness

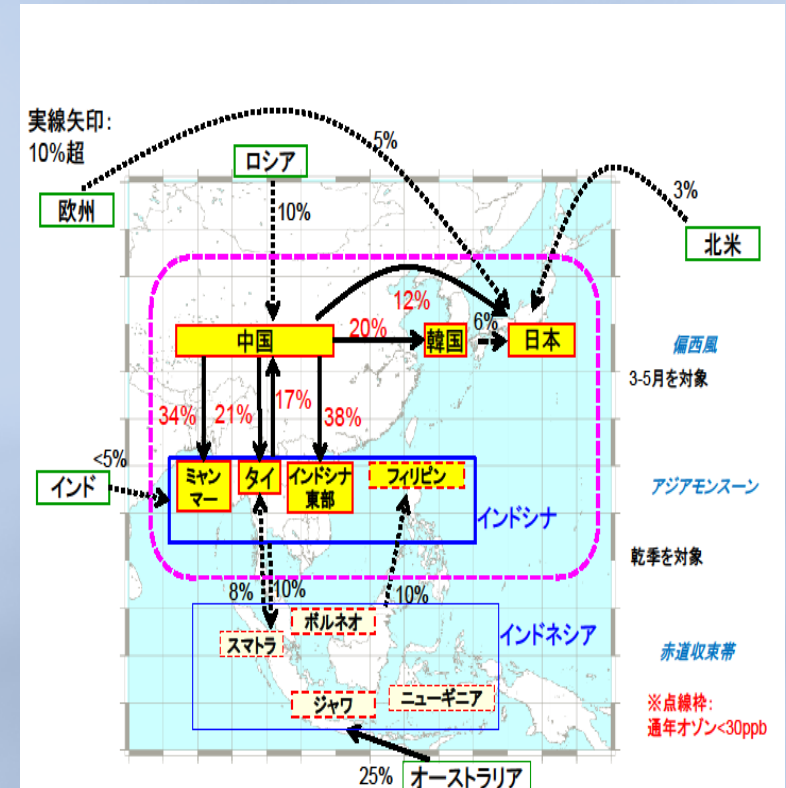
# Global & Regional Transport of Air Pollutants

## Task Force on Hemispheric Transport of Air Pollution (HTAP)



Air pollutants are transported globally. NEA also receives air pollution from North America and Europe.

## Regional Transport of Ozone



Air pollutants are transported between Northeast and Southeast Asia, not just within Northeast Asia

Some kind of comprehensive regional body is necessary (Asia or East Asia). Main options:

- a. New framework
- b. Existing framework (Joint Forum or EANET)

## Proposal for Regional Coordination: Revitalize the Joint Forum

- Previous Joint Forum had only 5 members: EANET, Male Declaration, ASEAN Haze Agreement, SPREP, Central Asian Environment Convention
- New framework should be more comprehensive
- Other frameworks are encouraged to join
- UNEP will hold discussions before BAQ in Nov. 2014

# Possibilities to merge existing frameworks

## EANET and LTP

### Main elements

- Expand scope and scale of monitoring, emissions inventories, modeling in the merged framework

### Advantages

- Reduce duplication and overlap
- Increase overall effectiveness
- Increase cost effectiveness
- Reduce management burden, international meetings for environment ministries

### Issues

- Location, network centers
- Links to other networks like ASEAN Haze, NEASPEC
- Decision not just by China, Japan, Korea; agreement of other EANET members is also needed.

## NEASPEC and LTP

### Main elements

- Add other NEASPEC countries to LTP framework, to broaden the scope

### Advantages

- Reduce duplication and overlap
- Increase overall effectiveness
- Increase cost effectiveness
- Reduce management burden, international meetings for environment ministries

### Issues

- Location, network centers
- Links with other networks like EANET
- Overlapping jurisdictions of environment and foreign ministries

- NEA might advance faster, but with narrower geographic scope

# Air Pollution and Climate Change

✓ Air pollution and climate change should be linked in regional frameworks

- Some sources of air pollution & GHGs are the same
- Especially Short Lived Climate Pollutants (SLCPs)
- Therefore there are cobenefits and cost synergies (enhanced cost effectiveness)
- Cost effective reductions can be calculated through modeling (e.g. GAINS)
  
- CCAC
  - Currently project-based, without coordinating with other air pollution or climate efforts.
  - Focuses on pollutants (and reduction measures) for sources not considered big GHG emitters (i.e. cookstoves, diesel)
  - Greater coordination might enhance effectiveness. Coordination needs modeling analysis.

# Science Panel / Scientific Assessment

- Japanese research project proposed an Asian Science Panel on Air Quality (ASPAQ)
- Now UNEP is creating a science panel which will conduct an air pollution assessment
  - First meeting expected in 1Q of 2015 (Ad hoc high level meeting).
  - Second meeting expected in late 2015 to discuss an assessment report to be published in early 2016.
  - Intention is to represent various existing initiatives and promote synergies.
- CCAC also has a science committee, conducting an assessment
- ASPAQ may facilitate coordination of science panels and assessments.

# Possible Roles for Subregional Frameworks

- Emissions inventories
- Health impact assessment
- Capacity building
- Abatement technology assessment of subregions
- Address subregion-specific issues



# Possible milestones for next steps

BAQ in November 2014

UNEA in May 2016

IUAPPA in Korea September 2016

# Selected IGES Resources

| Source   | URL   |
|--|---|
| <b>Strengthening International Cooperation on Air Pollution in Asia</b><br>At 16th IUAPPA World Clean Air Congress   | <a href="http://pub.iges.or.jp/modules/envirolib/view.php?docid=4745">http://pub.iges.or.jp/modules/envirolib/view.php?docid=4745</a> |
| <b>International Workshop on Strengthening the International Cooperation Framework and Science-Policy Interface to Promote Air Pollution Control in East Asia 2014</b>   | <a href="http://pub.iges.or.jp/modules/envirolib/view.php?docid=5300">http://pub.iges.or.jp/modules/envirolib/view.php?docid=5300</a> |
| <b>International Workshop on Strengthening the International Cooperation Framework and Science Policy Interface to Promote Air Pollution Control in East Asia 2013 Proceedings</b>   | <a href="http://pub.iges.or.jp/modules/envirolib/view.php?docid=4521">http://pub.iges.or.jp/modules/envirolib/view.php?docid=4521</a> |
| <b>Regional air quality management in China: the 2010 Guideline on Strengthening Joint Prevention and Control of Atmospheric Pollution</b><br>In International Journal of Sustainable Society<br>DOI: 10.1504/IJSSOC.2013.054713     | <a href="http://www.inderscience.com/info/inarticle.php?artid=54713">http://www.inderscience.com/info/inarticle.php?artid=54713</a>   |
| <b>Major Developments in China's National Air Pollution Policies in the Early 12th Five-Year Plan</b>  | <a href="http://pub.iges.or.jp/modules/envirolib/view.php?docid=4954">http://pub.iges.or.jp/modules/envirolib/view.php?docid=4954</a> |
| <b>Current Status and Future Potential of the Multi-pollutant Approach to Air Pollution Control in Japan, China, and South Korea</b><br>In 18th Annual Meeting of the Society for Environmental Economics and Policy Studies (SEEPS) | <a href="http://pub.iges.or.jp/modules/envirolib/view.php?docid=5026">http://pub.iges.or.jp/modules/envirolib/view.php?docid=5026</a> |
| <b>Perceptions on Transboundary Air Pollution among Scientists and Policymakers - Results from Interview Surveys in Japan -</b>  | <a href="http://pub.iges.or.jp/modules/envirolib/view.php?docid=4153">http://pub.iges.or.jp/modules/envirolib/view.php?docid=4153</a> |
| <b>Asian Co-benefits Partnership White Paper 2014 Bringing Development and Climate Together in Asia</b>  | <a href="http://pub.iges.or.jp/modules/envirolib/view.php?docid=5082">http://pub.iges.or.jp/modules/envirolib/view.php?docid=5082</a> |



**Thank You !**

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