

## ANNEX I: DETAILED ANALYSIS

This analysis reflects the individual commitments that were available on NAZCA as of Friday, November 20, 2015.

### A. Overview

- **Participating populations**
  - 2,044 cities and 116 regions, representing about 17 percent of the world global population have made 3,148 individual commitments.
  - 97 cities out of the top 300 global cities by GDP PPP (Purchasing Power Parity) are engaged on NAZCA, with a total GDP PPP close to \$20 trillion.
- **Participation of the largest companies**
  - Over one-third (609) of the 2000 largest companies by Forbes 2000 (2014) across the globe are engaged on NAZCA.
  - These 609 companies represent an aggregate revenue of \$19.2 trillion, equivalent to the national GDP of the China, Japan and Germany in 2014.
  - 385 public companies on NAZCA with revenue data from Bloomberg<sup>1</sup> have a total revenue of \$2.86 trillion USD.
- **Engaged investment**
  - 25 institutional investors, 14 banks and other private investors are issuing green bonds worth a total of \$21.6 billion.
  - Companies are also making investments - the Utilities industry alone is issuing over \$11 billion worth of green bonds for renewable energy projects.
- **Emissions reduction impact**
  - 298 companies from the CDP Global 500<sup>2</sup> are engaged on NAZCA.

### B. Emissions reduction - Total individual commitments: 3,986

- Seventy percent of all individual commitments include an emissions reduction goal.
- **99% of these emissions reduction commitments include a quantifiable reduction target.**
- Half of the emissions reduction commitments were made by 1,470 cities and regions (1,960 commitments)
  - Almost all of these include a quantifiable emissions targets, but the level of confidence and quality of these emissions targets vary. Different cities and regions set targets for different time periods or for different sectors.
    - 1,938 commitments set their emissions reduction target in terms of a percentage reduction.
    - 21 commitments set their emissions reduction target in terms of absolute tonnage.
- Half of the emissions reduction commitments were made by companies (1790 commitments) and investors (247 commitments).

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<sup>1</sup> Bloomberg Terminal LP, Retrieved on Dec. 2, 2015.

<sup>2</sup> CDP Global 500 (the largest 500 companies in the world by market capitalization in the FTSE Global Equity Index Series, CDP 2013), 482 out of the 500 report to CDP.

- Companies set quantifiable reduction targets in 1726 of their emission reduction commitments, and the investors set quantifiable reduction targets in all of their emissions reduction commitments.
  - **Half of these emissions reduction commitments with quantifiable targets (867) are based on per unit emissions reductions, while the other half (859) aim for emission reductions from overall operations.**
    - Reduction targets in these 859 commitments focusing on overall emissions range from a low of 0.3%, set by a utilities company, to 100%, set by the Danish Lego Group through renewable energy procurement.
    - On the industry level, based on these 859 commitments on overall business operations, **the Food & Staples Retailing industry seems to be most ambitious - the industry-average emissions reduction target from 26 commitments is 31.7%, the highest among the twenty industries.** The lower end of the range, 14.4%, comes from the Health Care Equipment & Services industry (10 commitments).
  - The three most-emitting sectors, in terms of scope 1 and scope 2 emissions identified by CDP, set the following emissions reduction goals:
    - Materials, 101 commitments, with an average reduction target of 17%.
    - Utilities, 56 commitments, with an average reduction target of 24%.
    - Energy, 19 commitments, with an average reduction target of 17%.
  - The most ambitious reduction target by investors is 74%, coming from one of the largest German real estate company - alstria.
  - Emissions reduction targets across different financial industries are largely similar:
    - Diversified Financials: 19.3%
    - Banks: 20.4%
    - Real Estate: 20.8%
    - Insurance: 24.6%
- **Intersection with LPAA areas**
  - **2,591 emissions reduction commitments do not fall into any LPAA areas**
    - Almost sixty percent (1,552) of these are made by cities and regions that focus on the total emissions of the local community.
    - Another 272 of these commitments aim to reduce emissions from government operations.
  - **1,395 emissions reduction commitments are related to an LPAA area.**
    - **The majority (1,215) relate to energy access and efficiency.** This is probably due to the fact that renewable energy projects can be considered as energy efficiency projects - conversion factors of fossil fuels from primary energy to final energy usually range from 30%-40%, while the conversion factors of renewable

energy can be as high as 100%.<sup>3</sup> Thus, renewable energy projects greatly improve energy efficiency.

- 384 emissions reduction commitments relate to **renewable energy**
- 193 emissions reduction commitments relate to **buildings**.
  
- **Use of Carbon Price - Total individual commitments 770**
  - About 15 percent of all individual commitments include a carbon price.
  - Companies and investors make the majority of carbon price commitments, making a total of 767 of these 770 commitments.
    - Almost half of the companies that have made individual commitments are deploying carbon prices, but only ten percent of these companies specified the price or price range they will use.
      - The average carbon price specified by companies is **\$28.60**.
    - 118 out of the 770 carbon price commitments made by companies and investors specified a price or price range on carbon. Among them, 93 commitments set a specific price, ranging from less than one dollar to over \$350.00. The lowest price is \$0.95, used by a Brazilian company, while the highest price is \$357.37, used internally by a Japanese automotive company.
      - 25 commitments set a price range on carbon. The average of the lower end of the range is \$15.30, while the average of the higher end of the range is \$54.50.
    - 104 commitments made by investors aim to set a price on carbon. Only 12 of these commitments specify what price they will use; the average price is **\$16.13**.
  - **Top emitting companies are acting on carbon prices:**
  - Over half of the companies that specified a carbon price are from the Materials industry (27 companies with an average carbon price at \$27.5) and the Utilities industry (20 companies with an average carbon price at \$20.9).
  - Three regions in North America (California, Ontario and Quebec) made the rest three commitments by setting up emission trading systems.
  
- **Green Bonds**
  - 16 cities and regions, 31 companies and 56 investors issued green bonds worth **\$47 billion**.
  - 16 cities and regions are issuing green bonds worth of **\$6.24 billion** through 22 commitments for projects on low carbon transport, renewable energy, energy efficiency, sustainable water management and waste management, sustainable land use (forestry) and climate adaptation and resilience.
  - 33 companies are making investment close to **\$30 billion** (including the issuance of **\$19 billion** green bonds) on climate actions, and over seventy percent of these companies are in the Utilities industry. The Utilities industry alone is issuing \$13.8 billion of green bonds for renewable energy projects.

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<sup>3</sup> Energy Primer. Chapter 1. Retrieved from: <http://www.iiasa.ac.at/web/home/research/researchPrograms/TransitionstoNewTechnologies/energyprimer/energyprimer.html>

- 25 institutional investors, 14 banks and other private investors are issuing green bonds worth a total of **\$21.6 billion**.

## C. Entities

### 1. Cities & Regions

- 2,044 cities and 116 regions, including all those making individual commitments plus the 23 percent of the Covenant of Mayors' cities represented on NAZCA, represent about 17 percent (1.26 billion) of the global population.
- What LPAA areas are cities and regions committing on individually?
  - Energy access & efficiency: 167 commitments
  - Renewable energy: 317 commitments
  - **Private finance: 0** commitments
  - Transport: 29 commitments
  - Resilience: 15 commitments
  - Building: 21 commitments
  - Forest: 7 commitments
  - Short term pollutants: 4 commitments
  - **Innovation: 0** commitments
  - **Agriculture: 0** commitments
- Cities and regions are participating in 7 out of the 10 LPAA Areas on NAZCA.
- The renewable energy action area has the most commitments across all of the different actors (cities, regions, businesses and investors) on the NAZCA platform. It encompasses 317 commitments in 191 different cities and regions, across 33 different countries.
- The resilience action areas include 15 commitments in 14 cities and regions from 4 countries (USA, Canada, France and Sweden).
  - The USA contributes most commitments to the resilience action area, through 9 commitments from 8 different cities and states, including: California, Los Angeles, Massachusetts, Spokane, Asheville, Venice, FL, Saint Paul, and Connecticut (2 commitments).
- **97 cities out of the top 300 global cities by GDP PPP (Purchasing Power Parity)<sup>4</sup> are making 343 individual commitments on NAZCA.**
  - The city Oslo alone has made 14 individual commitments, the highest number compared with other cities.
  - The USA contributes the most individual commitments (121).
- Geographic distribution of individual commitments made by these 97 engaged cities:
  - North America: 137 commitments from 34 cities
  - Europe & Central Asia: 129 commitments from 40 cities
  - East Asia & Pacific: 44 commitments from 15 cities
  - Latin America & Caribbean: 22 commitments from 5 cities

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<sup>4</sup> Global MetroMonitor: An Uncertain Recovery 2014. Retrieved from: [http://www.brookings.edu/~media/Research/Files/Reports/2015/01/22-global-metro-monitor/bmpp\\_GMM\\_final.pdf?la=en](http://www.brookings.edu/~media/Research/Files/Reports/2015/01/22-global-metro-monitor/bmpp_GMM_final.pdf?la=en)

- Sub-Saharan Africa: 11 commitments from 3 cities
    - Middle East & North Africa: 0 commitments
    - South Asia: 0 commitments
  - **The total GDP PPP of the 97 cities is about \$20 trillion (\$19,722 billion).**
    - Their GDPs range from \$32,480 million (Winnipeg, Canada) to \$1,617,000 million (Tokyo, Japan)
    - The average GDP PPP of the 97 cities is \$203 billion
- What are the most and least populous cities on NAZCA?
  - The range of the populations from NAZCA's cities and regions stretches from 175 (Sora, Spain) to 60 million (Antalya Metropolitan Municipality, Turkey).
  - The United States of America's city and regional commitments covered the largest population (206 million) on NAZCA.
  - Armenia's city and regional commitments covered the smallest population (1256) on NAZCA.
- Geographic distribution of the engaged cities and regions in both individual and cooperative commitments, and their population:
  - East Asia & Pacific: 128 cities and 35 regions
    - Population:
      - City: 192 million
      - Region: 80 million
  - Europe & Central Asia: 1756 cities and 51 regions
    - Population:
      - City: 312 million
      - Region: 164 million
  - Latin America & Caribbean: 23 cities and 4 regions
    - Population:
      - City: 97 million
      - Region: 70 million
  - Middle East & North Africa: 8 cities and no regions
    - Population:
      - City: 1 million
      - Region: 0
  - North America: 105 cities and 24 regions
    - Population:
      - City: 145 million
      - Region: 151 million
  - South Asia: 15 cities and 1 regions
    - Population:
      - City: 21 million
      - Region: 13 million
  - Sub-Saharan Africa: 8 cities and 1 regions
    - Population:
      - City: 22 million
      - Region: 0.4 million
- Which countries have the most city and regional commitments featured on NAZCA?
  - Italy has the most commitments (360) from 312 different cities and regions included on the platform.
  - USA has the second-most commitments (327) from 94 different cities and regions.

- Spain has the third-most commitments (248) from 227 different cities and regions.
- Japan has the fourth-most commitments (191) from 101 different cities and regions.
- Which city or region has the most commitments?
  - Oslo has the most commitments of any city or region (14).
  - Stockholm and Sydney have tied for the second-most commitments of any city or region (13).
- The timeline of the commitments range from short-, to mid-, to long-term.
  - Short (pre-2020) - 269 commitments
  - Mid (mid-2020 to 2030) - 1977 commitments
  - Long (post-2030) - 196 commitments
- **Green bonds**
  - 16 cities and regions are issuing green bonds worth \$6.24 billion through 22 commitments.
  - These 16 cities and regions come from 5 countries: Canada, France, South Africa, Sweden, and the United States of America.
  - These green bonds are issued for projects on low carbon transport, renewable energy, energy efficiency, sustainable water management and waste management, sustainable land use (forestry) and climate adaptation and resilience.
- **Emissions reductions**
  - 1470 cities and regions have made 1960 emissions reduction commitments.
  - 1959 commitments have set quantifiable emissions targets, but the level of confidence/quality on emissions targets varies, and there are targets set for different time periods or on different sectors.
    - 1938 commitments set their emissions reduction target in terms of percentage reduction.
    - 21 commitments set their emissions reduction target in absolute tonnage.
  - 19 commitments from 14 cities and regions in 11 countries set emissions intensity targets.
  - 9 commitments set targeted for carbon neutrality:
    - These include 7 cities and regions: Australian Capital Territory, Melbourne, Sydney, Ghent, Richmond, North Rhine-Westphalia, and Kadiovacik.
    - These include 5 countries: Australia, Belgium, Canada, Germany, and Turkey.
- The Chinese Alliance of Pioneering Peak Cities represents emissions reductions commitments outside of the NAZCA platform.
  - The 11 Alliance of Peak Pioneer Cities (APPC) in China commit to peak their carbon emissions before 2030. They represent a population of 148 million and an aggregate GDP of 1.65 trillion. China is also piloting low-carbon strategies in 36 cities and 6 provinces, representing about 40 percent of China's total population and over seventy percent of China's national GDP in 2014.<sup>5</sup>

## 2. Companies

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<sup>5</sup> The population of the 42 cities/provinces is 500 million; aggregate GDP is 7.7 trillion. China's total population is 1357 million, and GDP in 2014 is 10.4 trillion (World Bank data).

- 1,404 companies from 20 industry groups have made 2,687 individual commitments on NAZCA.
  - Over a third of these individual commitments are from companies in the Materials (397), Capital Goods (376), and Utilities (217) sectors.
- 298 companies from the CDP Global 500<sup>6</sup> are engaged on NAZCA.
  - Half of these companies (111 out of 298) include reduction targets for scope 1 and 2 emissions on their overall business operations through 117 commitments.
  - The emissions reductions from these 117 commitments is close to 80 MtCO<sub>2</sub>e.
    - 47 MtCO<sub>2</sub>e of this reduction applies to Scope 1 and 33 MtCO<sub>2</sub>e applies to Scope 2.
    - Calculations are based on CO<sub>2</sub>e emissions in 2013 of the 111 companies and their targets
    - The aggregate revenue of the 111 companies is \$6.7 trillion.
    - The 117 commitments are less than one tenth of the 1790 emissions reduction commitments that companies made in total; the emissions reduction could be 10 times greater.
- Time frames
  - Over 85% (2287) of these individual commitments from companies include a specific timeframe, with over half (1427) committed to pre-2020 action. Around seventy percent of these pre-2020 commitments (997) focus on emissions reductions, and over half of these emissions reduction commitments (583) plan to do so through energy access and efficiency activities.
  - One third (792) of these commitments have a mid-term timeline of 2020-2030, and less than 2% (68) committed to long-term goals.
- Top emitting sectors:
  - Materials: 68 of 283 Forbes 2000 companies in this sector are on NAZCA
  - Utilities: 40 of the 123 Forbes 2000 companies in this sector are on NAZCA
  - Energy: 35 of the 116 Forbes 2000 companies in this sector are on NAZCA
- Use of Carbon Price
  - Almost half of the 1404 companies (663) on NAZCA are deploying carbon prices, but only a handful of these companies (106) clearly mentioned a price or a price range.
    - Of these 106 companies, 83 specified a carbon price (rather than a price range).
    - Companies who are big emitters are acting: over half the these 106 companies come from the Materials (27 companies, average carbon price of \$27.5) and Utilities (20 companies, average carbon price of \$20.9) industries.
- Private Finance
  - 31 companies are making investments close to \$30 billion on climate actions through 35 commitments, and most of these companies are in the Utilities industry (23).

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<sup>6</sup> CDP Global 500 (the largest 500 companies in the world by market capitalization in the FTSE Global Equity Index Series, CDP 2013), 482 out of the 500 report to CDP.

- The majority of these investments (30 commitments) involve issuing green bonds for climate projects. **The Utilities industry alone is issuing over \$11 billion of green bonds for renewable energy projects.**
- 2 Dutch, 2 US companies and 1 French companies are making investment greater than \$1 billion, and all these investments are on renewable energy.
- Companies are also major contributors to LPAA areas of Transport (82% of Transport commitments are made by companies) and Energy Access & Efficiency (45% of Energy Access & Efficiency commitments are made by companies).

### 3. Investors

- 296 investors from 5 industry groups have made 646 individual commitments.
  - About forty percent of these individual commitments (252) are made by 72 institutional investors, such as asset management firms and pension funds, from 11 countries.
- 15 out of the world's largest 20 banks, in terms of market capitalization, are featured on NAZCA, with an aggregate market capitalization over \$2 trillion.
  - The five non-engaged largest banks are from Asia: four in China and one in Japan.
  - About ninety percent of the 204 individual commitments made by banks and diversified financials on NAZCA refer to emissions reduction from their own business operations, as opposed to investments in climate mitigation or adaptation. Less than one tenth of the commitments (13) are about issuing green bonds for climate projects.<sup>7</sup>
- **The individual commitments made by investors tend to have clear timeframes aiming for immediate climate actions; over ninety percent of commitments have a specific timeframe and over seventy percent (477) committed pre-2020.** 17% (109) committed to a 2020-2030 timeline, and barely any (3) committed beyond 2030.
- Over forty percent (286) of these individual commitments made by investors include either a specific investment amount (60) or an investment range (226).
  - **Nearly 90 percent (252) of the total 286 investment commitments are made by institutional investors.**
  - Specific investment amounts:  
Almost all the 60 commitments that specified an investment amount are about issuing green bonds for climate projects. In aggregate, **25 institutional investors, 14 banks and other private investors are issuing green bonds worth a total of \$21.6 billion.**
  - Investment ranges:  
The 226 commitments that include an investment range involve a more diverse portfolio. A range of \$24 billion - \$55 billion has been committed to invest on renewable energy facilities (87), green buildings (26), forest (17), energy access & efficiency (17), green bonds (10), etc.

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<sup>7</sup> See Annex II.

- Over half of the investors (153) made 247 commitments on reducing emissions from their business operations, accounting about 40 percent of the total individual commitments made by investors.
  - The most ambitious reduction target is 74%, coming from one of the largest German real estate company, alstria.
  - Emissions reduction targets across different financial industries are very similar on average:
    - Diversified Financials - 19.3% average reduction target
    - Banks - 20.4% average reduction target
    - Real Estate - 20.8% average reduction target
    - Insurance - 24.6% average reduction target
  - Institutional investors are not committing on emissions reductions, which makes sense because many of these institutional investors are very small teams.
- The remaining 16 percent of commitments (104) aim to set a price on carbon, however, only 12 of them specify the price they will use. The average carbon price set by the 12 investors is \$16.13.

### C. LPAA Areas

- **Top LPAA areas** that NAZCA commitments focus on include:
  - Energy access and efficiency (including multiple themes): 1567 commitments
  - Renewable energy (including multiple themes): 891 commitments
  - No individual commitments under the **innovation** action area
  - Energy access and efficiency and renewable energy occurred at the same time 376 times
  - The top 10 categories and category combinations (non-overlapping)
    - Energy access and efficiency, renewable energy: 291
    - Energy access and efficiency: 924
    - Renewable energy: 386
    - Renewable energy, private finance: 105
    - Buildings: 53
    - Private finance: 90
    - Transport: 106
    - Energy access, efficiency, transport: 88
- **Top entities** in different LPAA areas
  - Commitments made by companies account for 82% of Transport commitments and 45% of Energy Access & Efficiency commitments

#### 1. Energy Access & Efficiency

Individual commitments: 1567, Cooperative commitments: 6

- a. Entity
  - i. city: 112 commitments from 79 cities
  - ii. **company: 1178 commitments from 798 companies**
  - iii. investor: 222 commitments from 178 investors
  - iv. region: 55 commitments from 38 regions
- b. Geographic distribution

- i. East Asia & Pacific: 304
- ii. Europe & Central Asia: 802
- iii. Latin America & Caribbean: 34
- iv. Middle East & North Africa: 3
- v. North America: 344
- vi. South Asia: 39
- vii. Sub-Saharan Africa: 40

## 2. Renewable Energy

Individual commitments: 891, Cooperative commitments: 6

- a. Entity
  - i. city: 254 commitments from 146 cities
  - ii. **company: 405 commitments from 232 companies**
  - iii. investor: 169 commitments from 98 investors
  - iv. region: 63 commitments from 45 regions
- b. Geographic distribution
  - i. East Asia & Pacific: 130
  - ii. Europe & Central Asia: 458
  - iii. Latin America & Caribbean: 30
  - iv. Middle East & North Africa: 1
  - v. North America: 217
  - vi. South Asia: 33
  - vii. Sub-Saharan Africa: 21
- c. Facts
  - i. 2 Dutch, 2 US companies and 1 French companies are making investment greater than \$1 billion, and all these investments are on renewable energy.

## 3. Buildings

Individual commitments: 290, Cooperative commitments: 0

- a. Entity
  - i. city: 11 commitments from 11 cities
  - ii. **company: 167 commitments from 139 companies**
  - iii. investor: 102 commitments from 77 investors
  - iv. region: 10 commitments from 9 regions
- b. Geographic distribution
  - i. East Asia & Pacific: 56
  - ii. Europe & Central Asia: 151
  - iii. Latin America & Caribbean: 3
  - iv. Middle East & North Africa: 0
  - v. North America: 72
  - vi. South Asia: 1
  - vii. Sub-Saharan Africa: 6

## 4. Private Finance

Individual commitments: 288, Cooperative commitments: 5

- a. Entity
  - i. city: 0
  - ii. company: 41 commitments from 39 companies
  - iii. **investor: 247 commitments from 77 investors**
  - iv. region: 0
- b. Geographic distribution
  - i. East Asia & Pacific: 72

- ii. Europe & Central Asia: 140
- iii. Latin America & Caribbean: 2
- iv. Middle East & North Africa: 0
- v. North America: 71
- vi. South Asia: 2
- vii. Sub-Saharan Africa: 1

## 5. Transport

Individual commitments: 236, Cooperative commitments: 5

- a. Entity
  - i. city: 12 commitments from 11 cities
  - ii. **company: 193 commitments from 141 companies**
  - iii. investor: 15 commitments from 10 investors
  - iv. region: 16 commitments from 12 regions
- b. Geographic distribution
  - i. East Asia & Pacific: 28
  - ii. Europe & Central Asia: 163
  - iii. Latin America & Caribbean: 7
  - iv. Middle East & North Africa: 1
  - v. North America: 35
  - vi. South Asia: 0
  - vii. Sub-Saharan Africa: 1

## 6. Resilience

Individual commitments: 42, Cooperative commitments: 3

- a. Entity
  - i. city: 8 commitments from 8 cities
  - ii. company: 16 commitments from 13 companies
  - iii. investor: 11 commitments from 11 investors
  - iv. region: 7 commitments from 6 regions
- b. Geographic distribution
  - i. East Asia & Pacific: 0
  - ii. Europe & Central Asia: 17
  - iii. Latin America & Caribbean: 1
  - iv. Middle East & North Africa: 0
  - v. North America: 24
  - vi. South Asia: 0
  - vii. Sub-Saharan Africa: 0

## 7. Forests

Individual commitments: 39, Cooperative commitments: 3

- a. Entity
  - i. city: 2 commitments from 2 cities
  - ii. **company: 12 commitments from 6 companies**
  - iii. **investor: 20 commitments from 13 investors**
  - iv. region: 5 commitments from 5 regions
- b. Geographic distribution
  - i. East Asia & Pacific: 9
  - ii. Europe & Central Asia: 16
  - iii. Latin America & Caribbean: 1
  - iv. Middle East & North Africa: 0
  - v. North America: 12
  - vi. South Asia: 0
  - vii. Sub-Saharan Africa: 1

## 8. Short-Lived Climate Pollutants

Individual commitments: 34, Cooperative commitments: 3

- a. Entity
  - i. **city: 4 commitments from 4 cities**
  - ii. **company: 30 commitments from 25 companies**
  - iii. investor: 0
  - iv. region: 0
- b. Geographic distribution
  - i. East Asia & Pacific: 12
  - ii. Europe & Central Asia: 15
  - iii. Latin America & Caribbean: 0
  - iv. Middle East & North Africa: 0
  - v. North America: 3
  - vi. South Asia: 2
  - vii. Sub-Saharan Africa: 2

## 9. Agriculture

Individual commitments: 4, Cooperative commitments: 0

- a. Entity
  - i. city: 0
  - ii. **company: 3 commitments from 2 companies**
  - iii. investor: 1 commitments from 1 investor
  - iv. region: 0
- b. Geographic distribution
  - i. East Asia & Pacific: 0
  - ii. Europe & Central Asia: 2
  - iii. Latin America & Caribbean: 0
  - iv. Middle East & North Africa: 0
  - v. North America: 2
  - vi. South Asia: 0
  - vii. Sub-Saharan Africa: 0

## 10. Innovation

Individual commitments: 0, Cooperative commitments: 1