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# Predicting Paris: Forecasting the Outcomes of UNFCCC COP-21 With the Predictioneer's Game

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# **Predicting Paris: Forecasting the Outcomes of UNFCCC COP-21 With the Predictioneer's Game**

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## **Abstract**

An international agreement at Paris in the end of 2015 or (shortly) thereafter may indeed be feasible, yet some issues are predicted to take considerably longer than the end of 2015. More specifically, our forecasts suggest:

- The general principle of CBDR will prevail.
- Compared to the Kyoto Protocol, a weakened compliance system will be agreed upon.
- A legally binding agreement on mitigation is likely to come forward, yet country-specific mitigations targets are likely not to be legally binding.
- More than a collective non-binding commitment to adaptation is likely to come forward plus a strengthening of present institutions for adaptation.
- Financial commitments will be upgraded beyond \$ 100b p.a. after 2020, and emerging economies will be urged to contribute.
- Loss & damage will likely take much longer to negotiate than the end of 2015, and some separate agreement with new institutional arrangements is likely.
- The “no backsliding” principle will be applied to future negotiations on mitigation ambitions.
- The Ex-Ante Assessments will concentrate on aggregate ambitions, but not a full assessment of individual ambitions.

High expectations were raised for the international climate negotiations in 2009 – with the expectation that a successor agreement to the 1997 Kyoto Protocol under the 1992 UN Framework Convention on Climate Change (UNFCCC) would be finalized. These expectations were disappointed and led to a second preparatory phase for an international climate agreement with universal participation. These negotiations are expected to lead to an international agreement for the period beginning 2020 by the end of 2015 at Paris in order to guide national, international, and transnational policies. Are such expectations for an international climate agreement by mid-December 2015 at UNFCCC Conference of the Parties 21 (COP-21) well founded? More specifically, what is the likely contents of such an agreement as negotiators around the world face choices on a wide range of issues and major decisions still have to be taken?

Together with our colleagues from CICERO – Center for International Climate and Environmental Research Oslo and the University of Oslo,<sup>1</sup> the University of Groningen and the University of Strathclyde,<sup>2</sup> we derived the most pertinent issues under debate from the first negotiating text shared by the UNFCCC Secretariat on 25 February 2015 (United Nations Framework Convention on Climate Change 2015). Subsequently, we embarked on two research tracks. First, the CICERO team undertook an online expert elicitation of the likely *outcomes* at Paris (Kallbekken and Sælen 2015). Second, two different sets of predictions were undertaken on comparable issues, namely with the DECIDE model (Stokman and Thomson 2015) and the Predictioneer’s Game. In this report, we document the forecasts on 11 issues undertaken with the Predictioneer’s Game (Bueno de Mesquita 2009, Bueno de Mesquita 2011) with input data based on expert knowledge.

In the Predictioneer’s Game context, an “issue” is any specific policy question for which Stakeholders have differing preferences regarding the outcome. It is important that issues are defined such that the range of

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<sup>1</sup> We thank Guri Bang, Jon Hovi, Steffen Kallbekken, Håkon Sælen, and Arild Underdal.

<sup>2</sup> We thank Frans N. Stokman and Robert Thomson.

potential outcomes forms a single, continuous scale for all stakeholders. The farther an option is from a stakeholder's stated position (in either direction), the less preferred the option is. If, on an issue scale, position "C" is to the right of position "B," which is in turn to the right of position "A," then all stakeholders agree with this linear order and a stakeholder who prefers "A" to "B" will also prefer "A" to "C" and "B" to "C."

The 11 issues assessed can be grouped into five clusters (see Appendix 1 for details):

- overall differentiation principle,
- mitigation,
- adaptation,
- climate finance and loss & damage, as well as
- ambitions and review.

As stakeholders (actors), we chose the major countries and country groups participating in the global climate negotiations within the UNFCCC. The expert *input* data for the policy predictions (not to be confused with the expert elicitation of the likely *outcomes* of the Paris negotiations, documented, e.g., in Kallbekken and Sælen (2015) focuses on 16 groups of countries, including major countries by themselves. The EU28 was treated as one group. In particular, we included

- the African Group,
- AILAC - Association of Independent Latin American and Caribbean States,
- ALBA - Bolivarian Alliance for the Peoples of Our America,
- AOSIS – Alliance of Small Islands States,
- the Arab Countries,
- Bangladesh (if no data were available, data were replaced with sources from the group of LDCs – Least Developed Countries),
- Brazil,

- China,
- EIG – Environmental Integrity Group,
- the EU28,
- India,
- Indonesia,
- Umbrella Group (minus Japan, Russia, and the USA),
- Japan,
- Russia, and the
- USA.

As the Predictioneer’s Game is normally not used for country groups but for individual actors, we treat the prediction to follow as a test/feasibility study of the Predictioneer’s Game in the context of a mixture of major countries and groups of countries.

For each of the actors, the following inputs were generated (see Appendix 2 for details):

- stated position (outcome currently advocated by a stakeholder),
- salience (commitment the stakeholder has in pursuing this issue over all other issues and topics competing for attention),
- potential influence (bargaining clout of each stakeholder, relative to each other), and
- flexibility (stakeholder’s preference for reaching an agreement as compared to sticking to his or her preferred position even if it means failing to reach an agreement).

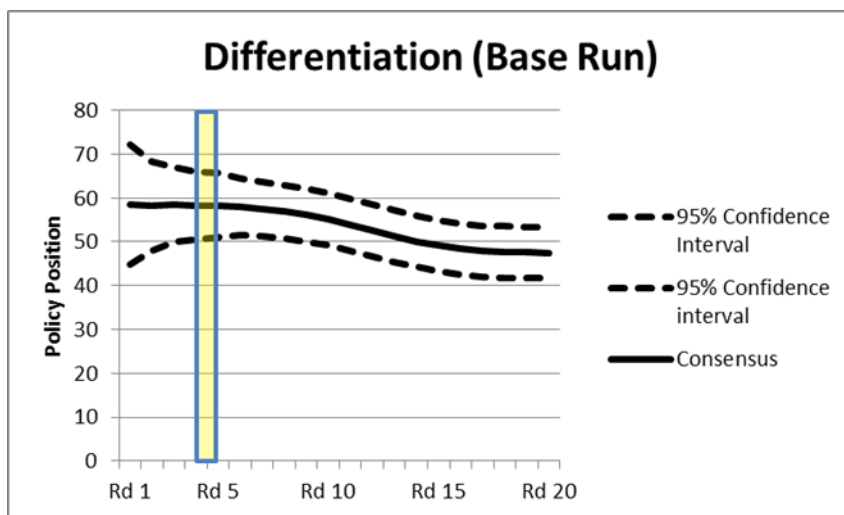
The forecasts to follow assume that no pertinent actor has been omitted and that domestic and transnational actors exert their influence by way of the stakeholders listed above. Furthermore, it is assumed that no trade-offs are made across issues (see above), i.e., each issue is negotiated on its own merits. In most cases, data were available for most actors. In case data were missing for a range of actors, forecasts were not undertaken (see

below). If only one actor had missing data – which was often the case for Indonesia – predictions were undertaken while omitting this stakeholder.

**1. Overall Differentiating Principle**

Perhaps the most challenging question in a future international climate agreement pertains to the equity principle used. Until recently, the division of countries into developing and developed countries (as enshrined in the Kyoto Protocol) held sway, yet China has been for nearly a decade the largest CO<sub>2</sub> emitter worldwide, and India has taken the third position in yearly emissions. Thus, the question arose whether a division in Annex 1 (developed) and non-Annex 1 (developing) countries remains the overarching principle in a future agreement.

*Issue: What will be the dominant basis for effort-sharing in the new agreement?*



Scale range:

0: no explicit differentiation (self-differentiation)

100: Annexes I and II of the Convention (i.e., dichotomization into developing/developed countries)

Our simulations suggest that the matter will be resolved after 4 rounds of negotiations with a predicted outcome of 58 (on a scale ranging from 0 to 100) and a 95% confidence interval of [50, 66].<sup>3</sup> The predicted outcome is clearly different from a dichotomous division of the negotiating parties into developed and developing countries. Our results suggest that the outcome will be close to the principle of Common but Differentiated Responsibilities and Respective Capabilities (CBDR) in light of national circumstances, yet not purely self-selection of ambitions (scale point 0). Focusing on the relative narrow 95% confidence interval of [50, 66], the CBDR principle is very likely to be mentioned, combined with some augmentation. The Arab countries and Russia are expected to be particularly hesitant about the outcome (as they prefer more individual differentiation), whereas ALBA and India would be substantially happier with results closer to maintaining the division of obligations according to developing vs. developed country status. Many countries are expected to make compromises rather quickly, and the equilibrium result may conceivably be reached by December 2015 or shortly thereafter in 2016.

In case we optimize for the position of the EU28 and include countries within  $\pm 10$  points on the scale of the EU28's position, only minor gains are achievable for the EU28 and similarly-positioned countries (results not shown here).

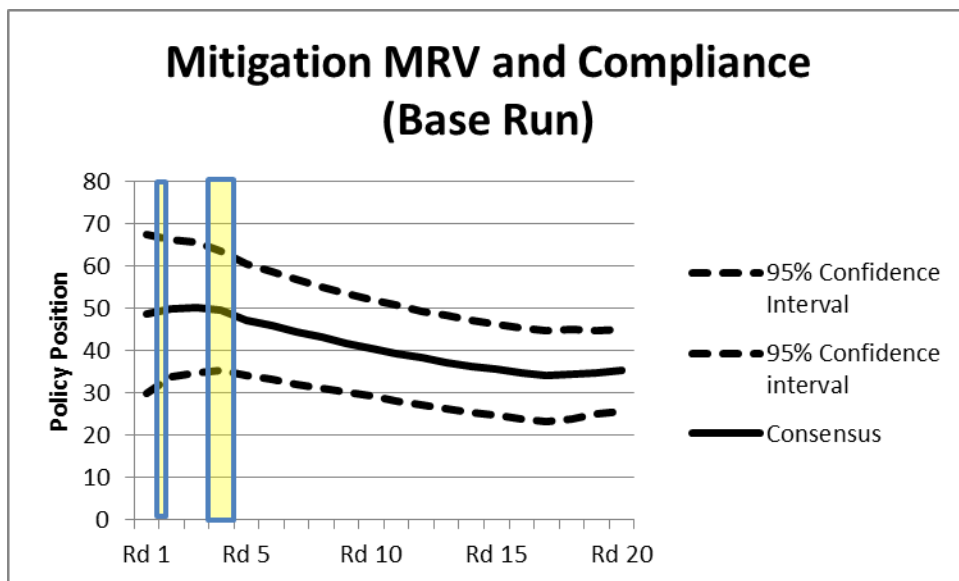
## 2. Mitigation

### 2.1 Mitigation: MRV and Compliance

*Issue: What should be the minimum MRV (measuring, reporting, and verification) and compliance provisions in the agreement on mitigation?*

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<sup>3</sup> We will hence report the smoothed mean (which is the average of weighted means from the previous, current, and future round) as well as the 95% confidence interval, e.g., 58 [50, 66].



Scale range:

- 0 International Consultation and Analysis (ICA)
- 100 Kyoto compliance regime

The Predictioneer’s Game suggests that the game ends in round 1 or 3 with a score of 50 [30, 68], (i.e., an International Consultation and Analysis combined with a multilateral consultative process). An International Assessment and Review with a committee on implementation and/or compliance lies outside the 95% confidence interval. If the equilibrium is reached in round 3, many countries favoring adoption of the Kyoto compliance regime make considerable concessions during these three rounds.

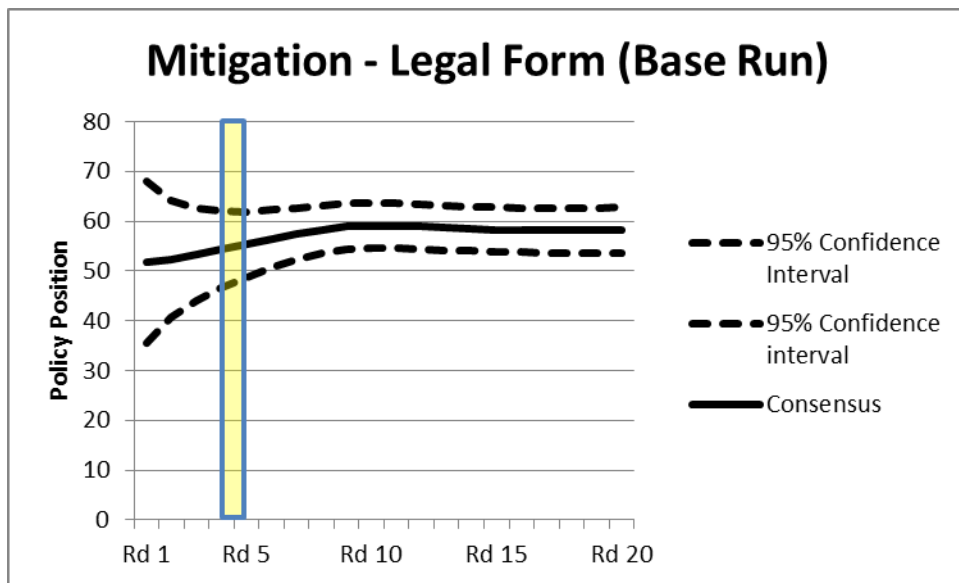
## 2.2 Mitigation: Legal Form

The legal form of an international agreement has been a major issue during the negotiations, in particular whether an internationally binding agreement with strict emission reduction goals is feasible. Witnessing the hurdles of ratifying the 1997 Kyoto Protocol in the USA as well as Chinese positioning with respect to taking over internationally binding obligations, this point is contentious. The Predictioneer’s Game indicates high levels of tension in



stakeholder interactions through the first four or five rounds, contributing to the pressure to break-off the discussion.

*Issue: To what extent should the agreement and its components relating to mitigation targets be (internationally) legally binding?*



Scale range:

- 0 No binding agreement or binding country-specific targets
- 100 Binding agreement plus binding, country-specific targets.

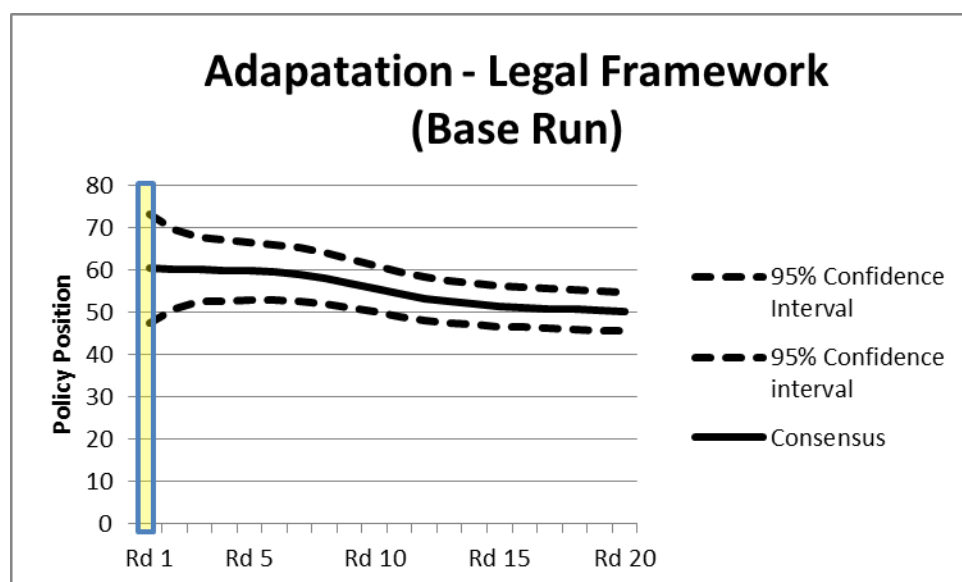
The Predictioneer’s Game predicts that the game ends in round 4 at scale point 53 [44, 63]. This equilibrium solution implies an internationally binding agreement on mitigation, yet internationally non-binding country-specific targets. This leaves enforcement of national obligations to national institutions, not international ones for specific mitigation obligations. The 95% confidence interval does not include a binding agreement with non-binding country-specific targets, *plus* MRV obligations. The Arab Countries, Bangladesh, and the EU28 will be among the least satisfied countries.

### 3. Adaptation

#### 3.1 Adaptation: Legal Framework

Adaptation has not played a major role in the UNFCCC and its 1997 Kyoto protocol, yet the issue of adaptation is at the heart of many developing countries.

*Issue: To what extent should countries' commitments to adaptation targets be country-specific and legally binding?*



Scale range:

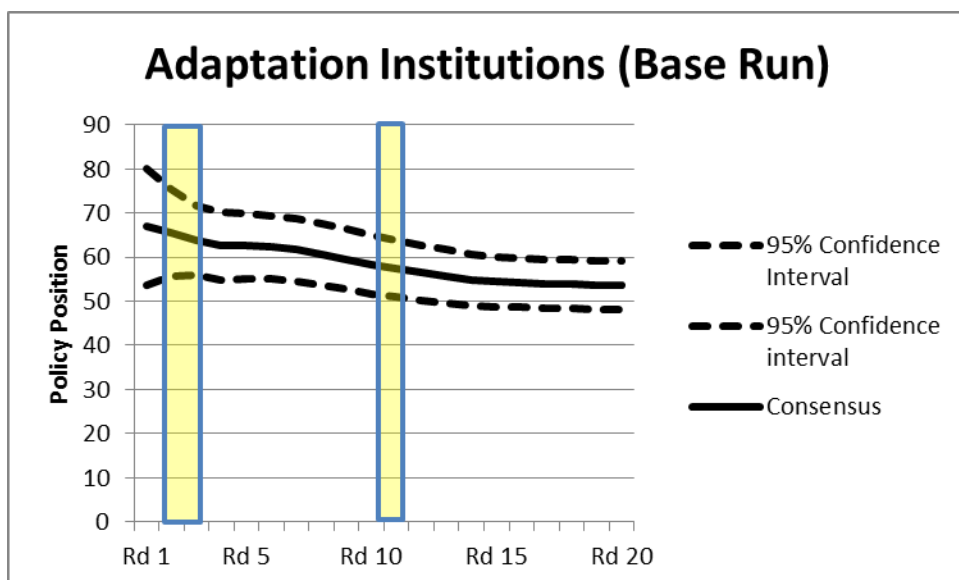
- 0 No new commitments to adaptation
- 100 Legally binding country-specific commitments

For the legal framework of adaptation, the Predictioneer’s Game was run for 24 negotiation rounds and predicts that the game will either end in round 1 at scale point 60 [48, 73] or negotiators will push through initial resistance and carry on discussions. In the latter case, the trend is downward on the scale and resolution is not reached. If the initial pressure to stop discussing the issue succeeds, then this implies that we should expect that more than a collective, non-binding provision is forthcoming; most likely some countries will offer non-binding commitments. Given the predicted results,

Russia and the USA should be particularly displeased which also holds for most developing country groups, excl. the governments of Brazil, China, and India. If, however, negotiations continue beyond round 1, there will be prolonged, indecisive debates and discussion.

**3.2 Adaptation Institutions**

*Issue: To what extent should the institutional framework for adaptation be strengthened?*



Scale range:

0 No strengthening

100 Establish subsidiary body on adaptation

For the creation of institutions for adaptation, the Predictioneer’s Game suggests rather fast negotiations ending in round 1 at position scale 67 [54, 80]. This point prediction implies a strengthening of present institutions (stronger mandate, funding, and knowledge platform), with at least some strengthening and a maximum of creating new institutions. Should, however, negotiations drag on until round 10 (substantially later than December 2015), some of the fervor in strengthening institutions for adaptation will be lost.

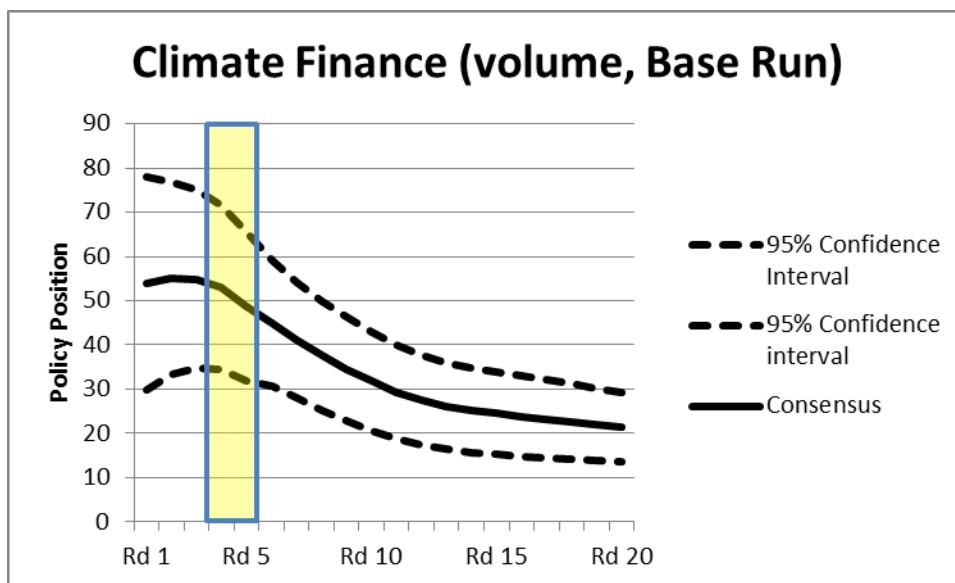
### 3. Climate Finance and Loss & Damage

Financial issues are potentially some of the most challenging ones to resolve as they may involve either quantifiable monetary contributions for international redistribution or compensation for damages originating from climate change.

#### 3.1 Climate Finance - Volume

Developed countries have promised to make available \$100 b per annum effective 2020 to enable developing countries to contribute to international climate policies. Given present challenges of substantiating commitments of private and public funds on the order of magnitude envisioned, will the amount be upgraded in the future or remain at \$ 100b p.a.?

*Issue: What will the size of agreed volume to be mobilized (private and public) beginning 2020 (p.a.)?*



Scale range:

- 0 no new target (i.e. \$100b p.a.)
- 100 ≥\$500 b (in excess of 1% of present OECD GDP p.a.)

The Predictioneer's Game predicts that the game will end in round 3 at scale point 55 [35, 75]. The smoothed mean implies a considerable upgrading beyond the \$ 100 b p.a. from public and private sources offered so far.<sup>4</sup> The 95% confidence interval is comparatively wide (see above), including amounts in the range of ca. \$ 175b - \$ 375b p.a.

All industrialized countries stay below the 95% confidence interval. As the amounts implied pose a major challenge, it would not be far-fetched that a range of those countries which are expected to provide major contributions may ultimately use a veto. Indeed, if the discussions are pushed past the third round, the trend becomes sharply negative. That, in fact, is why there is strong pressure to end debate in the third round, avoiding the cascade away from commitment.

### **3.2 Climate Finance - Who Pays?**

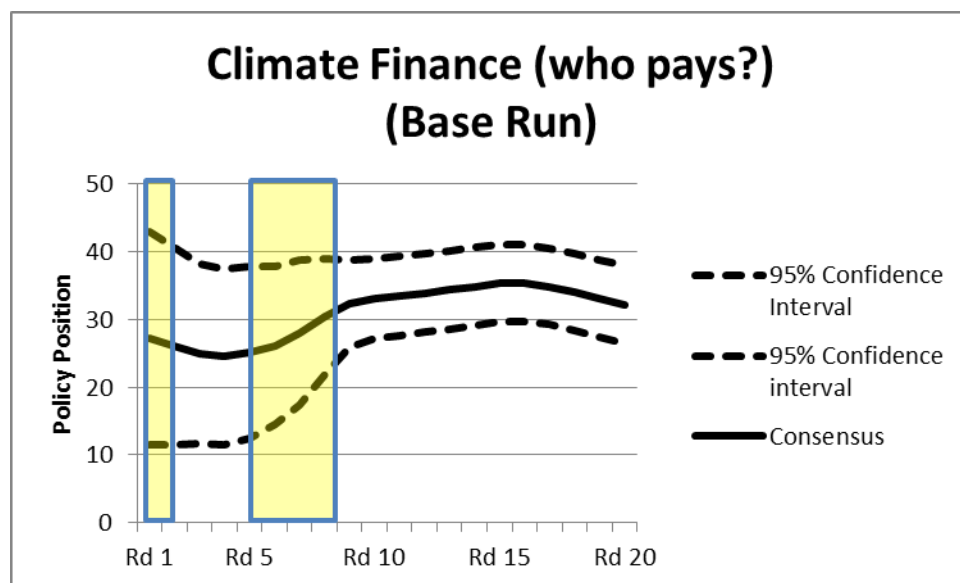
Given the hopes by some to mobilize major financial contributions in the context of a global climate agreement, the question arises, who shall make these financial contributions.<sup>5</sup> Our experts suggest that all stakeholders are either positioned at 0 (only developed countries are obliged to contribute) or 60 (developed countries and certain other countries required to contribute (e.g. "countries in a position to do so" or emerging economies)). Will emerging economies be asked to contribute to financing the global response to climate change at the international level?

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<sup>4</sup> We predict promises to be made, not the degree of their implementation.

<sup>5</sup> The predictions undertaken under 3.2 here are assumed to be unrelated to the outcomes predicted for 3.1.

Issue: Who will be requested to pay for climate finance?

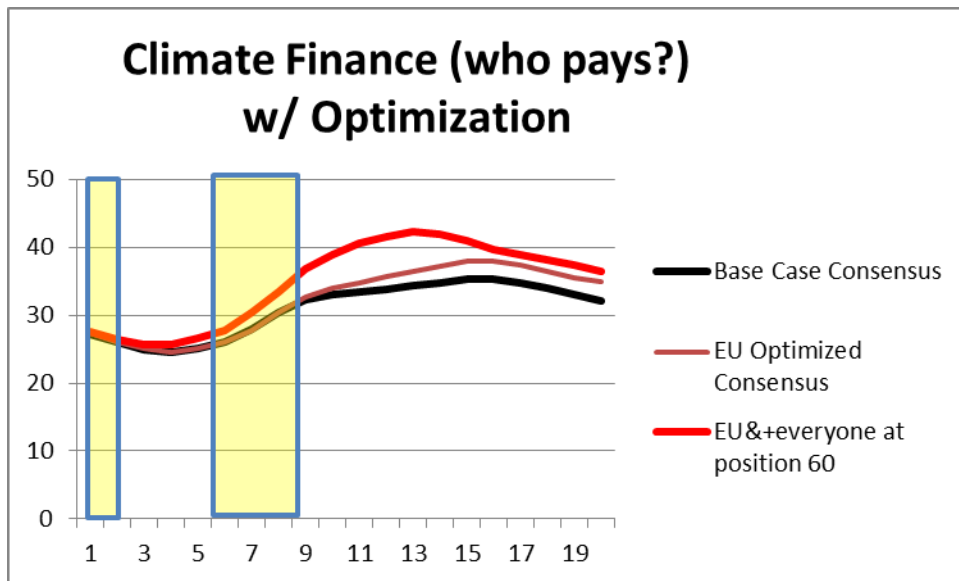


Scale range:

- 0: developed countries only required to contribute
- 100: all countries required to contribute

On the question of “who pays,” the Predictioneer’s Game suggests that the negotiations may stop in rounds 1 or 5. For round 1, the prediction is scale point 27 [12, 43], i.e., developed countries are required to contribute, while developing countries are demanded a bit more than voluntary contributions. If the equilibrium is reached in round 1, this will be in time for December 2015, otherwise, negotiations may well run into 2016. Focusing on the 95% confidence interval, at maximum, select developing countries will be strongly invited to make contributions. Many countries make only relatively small concessions - which explains the wide confidence interval if negotiations end in round 1. If they do end in round 1, the substantive findings are not very different with a smoothed mean at 25 [13, 38], however, the 95% confidence interval begins to narrow. ALBA, the Arab countries, Brazil, China, India, and Russia are forecast to remain particularly unhappy with the outcome.

What will happen if we optimize for the negotiation position for the EU 28 only as well as everyone else positioned at scale point 60 (i.e., AILAC, AOSIS, Bangladesh, EIG, EU28, and the Umbrella Group - except for Russia)?



Scale range:

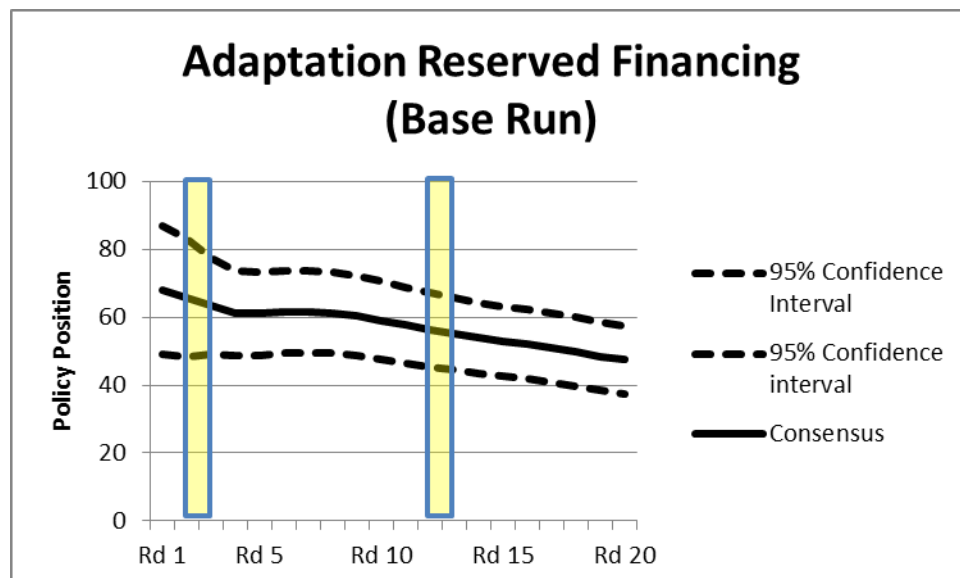
0: developed countries only required to contribute

100: all countries required to contribute

Even with optimization for the EU28 only or for all countries positioned at scale point 60, the game’s length and substantive results are essentially the same as for the base run without optimization.

### 3.3 Adaptation Reserved Financing

*Issue: To what extent should funds be reserved for adaptation?*



Scale:

- 0: no earmarking for adaptation
- 50: approximately 50% earmarked for adaptation
- 100: dedicated levy for adaptation

Until now, adaptation is without a dedicated finance stream for itself. The Predictioneer’s Game suggests that the negotiations will end in round 2 at scale point 66 [48, 83] in an effort to avoid subsequent erosion of an agreement. This smoothed mean implies that somewhat more than 50% of finances be dedicated to adaptation. The Umbrella Group, esp. Japan, Russia, and the USA, will be particularly displeased as they show little flexibility on the issue. Negotiations continue beyond round 2, the Predictioneers’ Game indicates a downward pressure on financial commitments for adaptation.

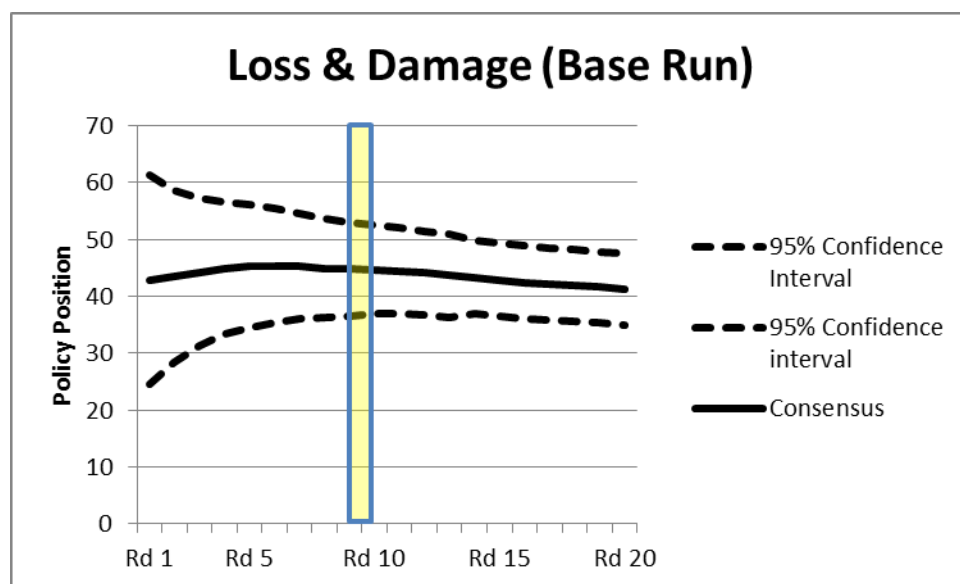
### 3.4 Loss & Damage

While adaptation is a well-established aspect of climate policy, the issue of loss & damage (L&D) is comparatively new and uncharted. In the very



long run, it is likely to deal with issues surrounding compensation for climate impacts not avoided or reduced by either mitigation or adaptation.

*Issue: To which degree will loss & damage (L&D) be included in an agreement?*



Scale range:

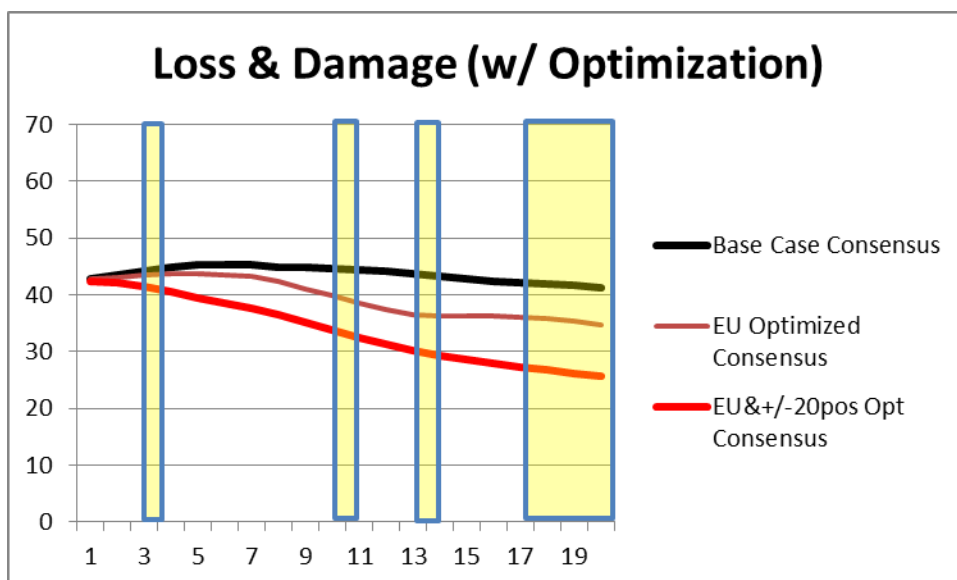
0: no mention/omission of L&D

100: separate chapter on L&D and new non-financial and financial elements, including a compensation regime

The Predictioneer’s Game predicts that the negotiations end in round 9 at scale point 45 [37,53], i.e., the equilibrium is reached well after December 2015, perhaps running into 2016/17. Compared to the status quo (20), the establishment of the Warsaw International Mechanism, the smoothed mean at 45 indicates that we should expect at least a separate chapter on L&D with new institutional arrangements as part of an international agreement, yet with little additional obligations. Should a global climate agreement without L&D inclusion be finalized by the end of 2015, our forecasts could translate into a *separate* international agreement with new institutional arrangements that elevates the issue of L&D, yet does not add more than a few non-financial elements (such as coordination and capacity building). The 95% confidence interval clearly indicates departure from the status quo (20) and some probability that non-financial elements might be included.

Many developing countries (ALBA, AILAC, AOSIS, Bangladesh and India) quickly make concessions and move to the predicted outcome, with the exception of China and Brazil (which are originally positioned reasonably close to the ultimate outcome). The EU moves into the direction of the consensus, yet Japan, Russia, and the USA hold positions in round 9 substantially different from the consensus. A comprehensive compensation regime does not appear to be within the scope of the present negotiations.

How do the results change if we optimize for the EU28 (opening position: 20) and countries within a  $\pm 20$  scale point interval around the EU28's position?



Scale range:

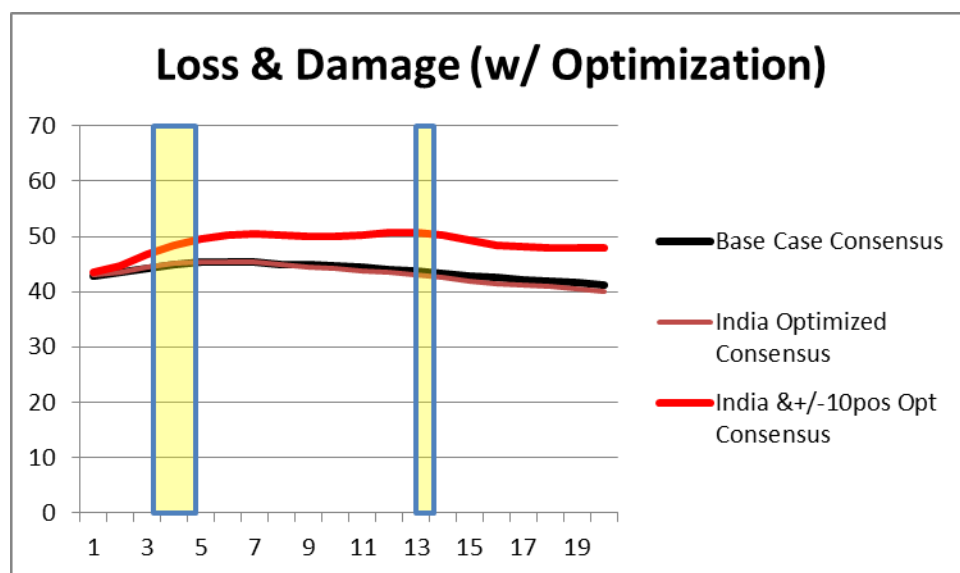
0: no mention/omission of L&D

100: separate chapter on L&D and new non-financial and financial elements, including a compensation regime

Optimizing for the EU28 leads, inter alia, to two end points in round 3 and round 10, both of which are similar to the results of the base run – except for the length of negotiations. If the negotiations are optimized for the EU28 and actors  $\pm 20$  scale point interval (essentially all industrialized countries plus the Arab countries), a substantial improvement of 10 scale points over the base run is reached if negotiations stop in Round 10 as compared to the Base Run or a deal is accepted in Round 3. Thus, optimization for a coalition surrounding the EU28's position on L&D yields global results

substantially closer to the ideal point of the EU28 and roughly within the scope of COP-21.

Conversely, what would happen if we optimized for the position of India and  $\pm 10$  scale point interval around India's position?



Scale range:

0: no mention/omission of L&D

100: separate chapter on L&D and new non-financial and financial elements, including a compensation regime

As in the case for optimization for the EU28 only, an optimization for India (opening position: 90) ends in round 3 with barely a difference in the equilibrium outcome as compared to the base run. If optimized for India  $\pm 10$  scale point interval (comprising ALBA, AOSIS, India, and Indonesia), this results in an equilibrium in round 3 that is three scale points closer to the position of India, yet in the opposite direction as compared to the EU28 optimization.

Whenever optimization for one of the actors or groups of actors is undertaken, the models equilibrate substantially faster as compared to the base run and lead to agreement until Dec. 2015 or shortly thereafter. In a non-optimized setting, agreement will take place considerably later.

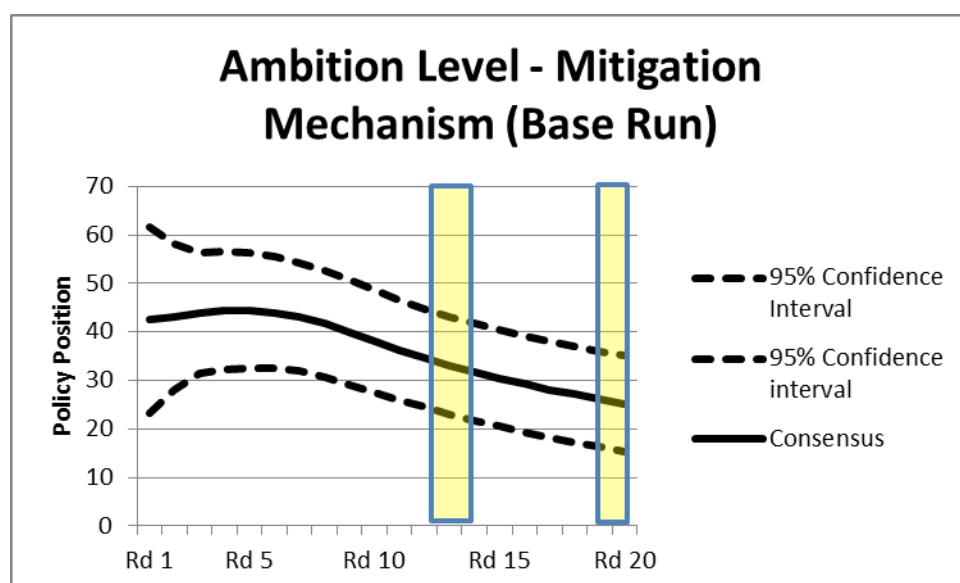
#### 4. Ambition and Review

Ambition levels come in three flavors, namely (i) an overarching principle, (ii) specific collective ambitions for 2050 and 2100, and (iii) the ex-ante assessment (EAA) of future (Independent) Nationally Determined Contributions ((I)NDCs). As we did not have sufficient input data for collective ambitions for issue (ii) across country groups, we abstained from predictions on these issues and concentrate on the first and third issue.

##### 4.1 Ambition Level – Mitigation Mechanism

Global climate negotiations will not stop at Paris in the end of 2015, even if an agreement is reached. Thus, the question arises how the global climate regime is supposed to develop in the future. In particular, shall the parties of the UNFCCC enshrine a uni-directional principle as a yardstick for directions beyond an initial post-2020 agreement?

*Issue: What should be the mechanism for strengthening commitments over time?*



Scale range:

0: no ambition mechanism

100: binding commitment to strengthen targets in line with the 2 degrees goal

The Predictioneer's Game suggests that negotiations end with a smoothed mean of 35 [25, 45] in round 12, i.e., most likely well into 2017.

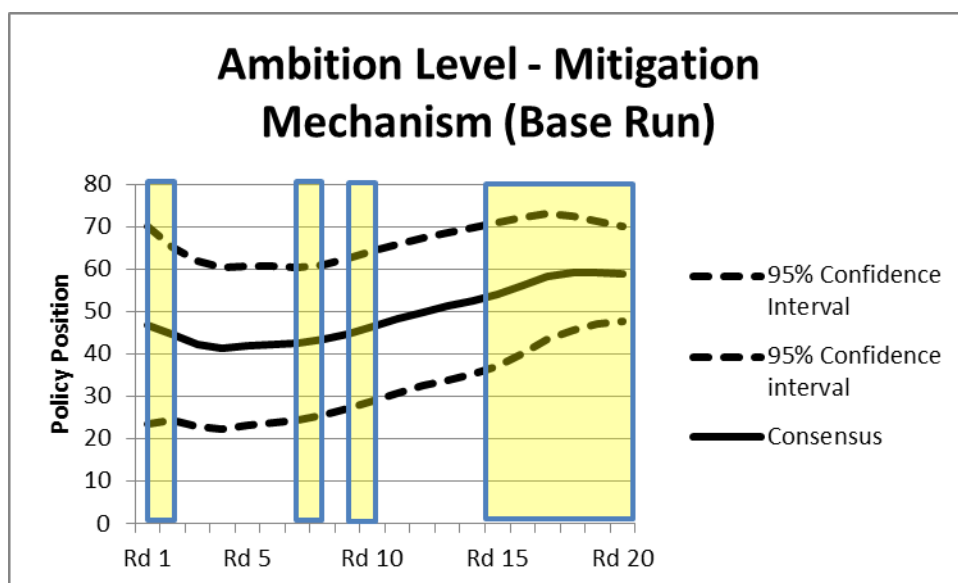
Substantively, the equilibrium implies adoption of the “no backsliding” principle, i.e., actors cannot adopt positions in the future that are less onerous than those taken over now. At the upper end of the 95% confidence interval, a non-binding progression principle may be adopted.

Many smaller developing countries are predicted to make considerable concessions to their high ambitions. Many industrialized countries would be willing to go further in strengthening progression, yet are held back by ALBA, China, and India. While the 2°C target has been accepted at and after Copenhagen (2009), there is little chance of adopting a legally binding commitment to strengthen mitigation *targets* in line with the 2°C goal.

#### **4.2 Ex-Ante Assessment (EAA) of future (I)NDCs**

Besides a general principle on how to develop *future* country positions, these positions may (or not) merit an ex-ante assessment system.

*Issue: Which provisions for assessment and review of the nationally determined contributions will be included in an agreement?*



Scale range:

0: no EAA

100: EAA of aggregate ambition and technical EAA of individual INDCs (transparency, clarity, comparability, etc.), plus a political assessment of individual INDCs (ambition and equity/fairness), plus a formal mechanism for involving inputs from civil society

On this issue, the Predictioneer’s Game predicts a smoothed mean outcome at scale point 47 [24, 70], i.e., beyond an ex-ante assessment (EEA) of *aggregate* ambitions, but not yet a full technical EEA of *individual* positions. The (wide) 95% confidence interval includes departure beyond the EEA of aggregate ambitions and includes slightly higher ambitions than a technical EEA of individual INDCs, on the one side, and essentially an EEA of aggregate ambitions only, on the other side of the interval. Many countries at the upper and lower ends of the scale (0, 100) are likely to be displeased.

## 5. Summary

An international agreement at Paris in the end of 2015 or (shortly) thereafter may indeed be feasible, yet some issues are predicted to take considerably longer than the end of 2015. More specifically, our forecasts suggest:

- The general principle of CBDR will prevail.
- Compared to the Kyoto Protocol, a weakened compliance system will be agreed upon.
- A legally binding agreement on mitigation is likely to come forward, yet country-specific mitigations targets are likely not to be legally binding.
- More than a collective non-binding commitment to adaptation is likely to come forward plus a strengthening of present institutions for adaptation.
- Financial commitments will be upgraded beyond \$ 100b p.a. after 2020, and emerging economies will be urged to contribute.
- Loss & damage will likely take much longer to negotiate than the end of 2015, and some separate agreement with new institutional arrangements is likely.
- The “no backsliding” principle will be applied to future negotiations on mitigation ambitions.
- The Ex-Ante Assessments will concentrate on aggregate ambitions, but not a full assessment of individual ambitions.

## Appendix 1: Issues and Scales

### 1. Differentiation

*What will be the dominant basis for effort-sharing in the new agreement?*

0: No explicit differentiation (self-differentiation)

25: National circumstances

50: CBDR-Respective Capabilities in light of national circumstances

75: CBDR-Respective Capabilities (with no direct reference to the Convention's Annexes or Articles referring to those Annexes)

100: Annexes I and II of the Convention

### 2. Mitigation MRV and compliance

*What should be the minimum MRV and compliance provisions in the agreement on mitigation?*

0: International Consultation and Analysis (ICA)

45: ICA plus multilateral consultative process

65: International Assessment and Review (IAR)

75: IAR plus committee on implementation and/or compliance

100: Kyoto compliance regime

### 3. Mitigation legal form

*To what extent should the agreement and its components relating to mitigation targets be (internationally) legally binding?*

0: No binding agreement or binding country-specific targets

30: Binding agreement without country-specific targets

50: Binding agreement plus obligation to have a (nonbinding) country-specific target (NDC)

70: The above plus obligation on measuring, reporting and verification

100: Binding agreement plus binding, country-specific targets

### 4. Adaptation legal framework

*To what extent should countries' commitments to adaptation targets be country-specific and legally binding?*

0: No new commitments to adaptation

40: Collective, non-binding provisions. E.g. "all parties are encouraged to integrate adaptation into their national plans"

80: Non-binding country-specific commitments

100: Legally binding country-specific commitments



**5. Adaptation institutions**

*To what extent should the institutional framework for adaptation be strengthened?*

0: No strengthening

60: Strengthen present institutions (stronger mandate, funding and knowledge platform)

80: Establish new institutions stronger than present ones

100: Establish subsidiary body on adaptation

**6. Climate Finance (volume)**

*What will the size of agreed volume to be mobilized (private and public) beginning 2020 (p.a.)?*

0: no new target (i.e. \$100b p.a.)

20: start at \$100b p.a. and be regularly scaled up

40: \$ 200b p.a.

60: \$ 300b p.a.

80: \$ 400b p.a.

100: ≥\$500 b (in excess of 1% of present OECD GDP p.a.)

**6 bis. Climate Finance (who pays?)**

*Who will be requested to pay for climate finance?*

0: Developed countries only required to contribute

20: Developed countries required to contribute, and other countries invited to contribute voluntarily

60: Developed countries and certain other countries required to contribute (e.g. “countries in a position to do so” or emerging economies)

80: All countries minus LDCs and SIDS required to contribute

100: All countries required to contribute

**7. Adaptation reserved financing**

*To what extent should funds be reserved for adaptation?*

0: No earmarking for adaptation

50: Approximately 50% earmarked for adaptation

100: Dedicated levy for adaptation

**8. Loss and Damage**

*To which degree will loss & damage (L&D) be included in an agreement?*

0: No mention/omission of L&D

10: Preambular reference only

20: Reference to Warsaw International Mechanism (WIM) (under adaptation)

30: Separate chapter on L&D with little substance

40: Separate chapter on L&D and new institutional arrangements with little substance

50: Separate chapter on L&D and new institutional arrangements with new non-financial elements (such as coordination and capacity-building)

70: Separate chapter on L&D and new mechanism with new non-financial and financial elements (such as insurance) but no compensation regime

100: Separate chapter on L&D and new non-financial and financial elements, including a compensation regime

**9. Ambition level – mitigation mechanism**

*What should be the mechanism for strengthening commitments over time?*

0: No ambition mechanism

30: No backsliding principle

40: A non-binding progression principle

65: A binding progression principle

100: A binding commitment to strengthen targets in line with the 2 degrees goal

**10. Ambition 2050**

*What should be the strength of the mitigation goal set for 2050?*

0: No 2050 goal

20: Qualitative goal

30: Qualitative goal with a roadmap

50: Goal of 40% GHG reduction relative to 2010

70: Goal of 70% GHG reduction relative to 2010

100: Goal of zero net emissions

**11. Ambition 2100**

*How ambitious should the mitigation goal for 2100 be?*

0: No 2100 goal

20: Qualitative goal

30: qualitative goal with a roadmap

80: Goal of zero net emissions

100: Goal of negative net emissions

**12. Ex-ante assessment (EAA) of future (I)NDCs**

*Which provisions for assessment and review of the nationally determined contributions will be included in an agreement?*

0: Option 1: No EAA

20: Option 2: EAA of aggregate ambition

60: Option 3: EAA of aggregate ambition and technical EAA of individual INDCs (transparency, clarity, comparability, etc.)

90: Option 4: Option 3 plus a political assessment of individual INDCs (ambition and equity/fairness)

100: Option 5: Option 4 and a formal mechanism for involving inputs from civil society

## Appendix 2: Core Concepts of the Predictioneer's Game

### *Stated Position of Stakeholders*

The stated position is the outcome currently advocated by a stakeholder.

It is important to note that the stated position is not necessarily any of the following positions, which stakeholders will often not reveal:

- the outcome that the stakeholder would truly prefer above all others,
- the outcome that the stakeholder anticipates at the end of the negotiations, or
- the outcome that the stakeholder is prepared to accept.

It is not uncommon for a stakeholder to have a “public” position on an issue that is different than the position that he advocates to other stakeholders. One example of this is when elected officials have a public position geared to their electorate, whereas they indicate their actual bargaining position on an off-the-record basis to other stakeholders. Where available, it is the indicated bargaining position that should be recorded as the stated position.

### *Salience*

Salience is the commitment the stakeholder has in pursuing this issue over all other issues and topics competing for attention. Salience is not a measure of the percentage of time or effort that a stakeholder will devote to an issue. Rather, salience is a measure of the stakeholder's preparedness to focus on the issue when it comes up, even if it means putting aside some other issue. Salience is not primarily judged in relation to other stakeholder's time and attention.

### Numerical Definitions:

- 90-100: This is the most important issue to the stakeholder. The stakeholder would drop whatever they are doing and turn to this issue whenever asked.
- 70-80: This issue is very important to the stakeholder. It is certainly one of the most important issues. The stakeholder would try very hard to reschedule to handle this issue when it arises.
- 50-60: This is one of several important issues. Others are more important. The stakeholder would have to drop this if one of those other issues arose, but otherwise would try to focus on this issue.
- 30-40: This is an issue the stakeholder cares about, but it is not that important to the stakeholder. The stakeholder has many more important issues to deal with and so generally would not drop what they are doing to deal with this and generally would focus on something else.

- 10-20: This is a minor issue to the stakeholder. The stakeholder rarely pays attention or makes much effort.
- <10: The stakeholder really doesn't care about this issue.

*Potential Influence*

Potential influence, often referred to as “resources,” is simply the bargaining clout of each stakeholder, relative to each other. It is a measure of the amount of influence a stakeholder could have on determining the outcome relative to other stakeholders if all stakeholders were fully motivated.

It is important to distinguish potential power from salience. Just because a stakeholder is not involved actively in an issue does not mean that the stakeholder could not exert great influence. The president of the United States, for instance, has the potential to influence many issues. The president controls a lot of resources but is also very busy, so few issues can have high salience. Advisers to the president, by comparison, may have fewer resources but exert more effective influence because they exert more effort (the issues have higher salience for them). Their influence scores should be lower than the president's and their salience scores should be higher in this case.

When comparing one stakeholder's resources with another's, one measures only those resources controlled directly by the stakeholder and not resources controlled by associates or allies of the stakeholder who are also listed as stakeholders. This is important to avoid double counting.

Numerical Definitions:

- 100: The most powerful stakeholder on this issue. There can be more than one group at this score or at any other score.
- All other: A stakeholder's value must be positive and must be  
Values evaluated relative to 100 (or the maximum score assigned) and relative to the values other stakeholders. So, two stakeholders with 40 and 60 would equal the one stakeholder at 100 in a head to head contest with no one else involved if everyone tried as hard as they could. Two groups at 15 and 30 would, if they shared a common position, be very close in potential influence to a group at 40 and probably would just barely persuade the 40 to accept their point of view if there were no other players involved. The resource scores should not be thought of as percentages. A decision-maker with a score of 100 does not have 100 percent of the resources and may, in fact, have only a small percentage of the total. The total, of course, is the sum of all of the resources across all of the groups or decision-makers.

*Flexibility/Resolve*

Every stakeholder is assumed to care about two dimensions when addressing an issue. The “position” variable assesses the outcome the player currently advocates. Flexibility/Resolve evaluates the stakeholder’s preference for reaching an agreement as compared to sticking to his or her preferred position even if it means failing to reach an agreement.

The variable ranges between 0 and 100. Higher values reflect greater flexibility; lower values greater resolve.

- A convenient rule of thumb is to think of the value as revealing the percentage magnitude of proposed position shifts the player would pay any attention to. For example if the scale is 100 points, a player with flexibility of 20 would listen to arguments for positions within 20 points higher and 20 points lower than his/her current position.
- Players generally have a value on this variable that is 35 or lower.
- A value of 0 means the player declares that s/he is immovable and resolved to stick to the current position. The model recognizes that this may be a bluff or a sincere position and calculates the odds of each as part of its updating process.

*Optimization*

Nash equilibrium requires that each player adopts the best strategy available to them given the constraints of the game. That, of course, is true for the Predictioneer's Game in which players pursue Perfect Bayesian Equilibrium strategies. However, the model also assumes that players cannot look ahead more than one period and that they act rationally on their beliefs about each other player's type.

The Predictioneer’s Game assumes that when there are many players involved people have a harder time sifting through all interactions to fully realize the information available to them about other players. That is, players observe outcomes in each round but not the details of interactions between player pairs that do not involve them. The game's software exploits this asymmetry between what the computer "knows" by keeping track of all pairwise interactions (and third party contributions to them) in each period while players only know this information for the pairs for which they are members. This means that the output allows us to exploit information more fully than players can (by assumption) and so the output identifies "optimal" proposals that any selected player or group of players could make in each round, taking advantage of fuller information about player types computed by the model but assumed not to be accessible to the players who only update on their pairwise interactions.

The Predictioneer’s Game can be set to use these "optimal" proposals rather than the proposals players otherwise are expected to make in the game. The "optimal" proposals correct both for errors of commission -- asking for less

than one could have gotten or asking for too much to be taken seriously -- and errors of omission -- failing to make a proposal when a credible proposal was available but outside the belief structure of the player involved. It is, of course, difficult to implement "optimized" actions but their effects can generally be approached. Hence, they provide information on the maximum deviation a player can achieve relative to the un-optimized "base case."

## References

- Bueno de Mesquita, B. (2009). *The Predictioneer's Game: Using the Logic of Brazen Self-Interest to See and Shape the Future*. New York, Random House.
- Bueno de Mesquita, B. (2011). "A New Model for Predicting Policy Choices." *Conflict Management and Peace Science* 28(1): 65-87.
- Kallbekken, S. and H. Sælen (2015). *Predicting Paris: Forecasting Key Outcomes from COP 21 Using an Expert Survey*. Oslo, CICERO <  
[http://www.researchgate.net/publication/282974577\\_Predicting\\_Paris\\_-\\_Forecasting\\_key\\_outcomes\\_from\\_COP\\_21\\_using\\_an\\_expert\\_survey](http://www.researchgate.net/publication/282974577_Predicting_Paris_-_Forecasting_key_outcomes_from_COP_21_using_an_expert_survey) .
- Stokman, F. N. and R. Thomson (2015). *Forecasting the Paris 2015 UNFCCC Negotiations. The Exchange Model's Analysis of Developments and Potential Obstacles to Reaching an Agreement*,  
[http://www.researchgate.net/publication/282974338\\_Forecasting\\_the\\_Paris\\_2015\\_UNFCCC\\_Negotiations.\\_The\\_Exchange\\_Model's\\_Analysis\\_of\\_Developments\\_and\\_Potential\\_Obstacles\\_to\\_Reaching\\_an\\_Agreement](http://www.researchgate.net/publication/282974338_Forecasting_the_Paris_2015_UNFCCC_Negotiations._The_Exchange_Model's_Analysis_of_Developments_and_Potential_Obstacles_to_Reaching_an_Agreement) .
- United Nations Framework Convention on Climate Change. (2015). "Ad Hoc Working Group on the Durban Platform for Enhanced Action: Negotiating Text."  
<https://unfccc.int/resource/docs/2015/adp2/eng/01.pdf>.