
# The 2012 ICCG Climate Think Tank Ranking.

# A Methodological Report

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*Disclaimer: The results of this ranking have been based on data collected through a survey, and through a search on the most renowned Think Tanks' and Climate Change Organizations' websites. We apologize for not having included all Think Tanks in the field of climate change economics and policy. Of course, we would be glad to consider additional Think Tanks for the next edition of the ICCG Climate Think Tank Ranking.*

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## Executive Summary

This Report presents the methodology that led to the first ICCG Climate Think Tank Ranking, a ranking on think tanks that specialize in the field of climate change economics and policy. A literature overview of other think tanks and University rankings is provided to confirm the unique nature of the ICCG ranking. Indeed, until today, rankings have been based mainly on opinion surveys (McGann), or on bibliometric indicators (ARWU e HEEACT). However, the 2012 ICCG Climate Think Tank Ranking is based on solid quantitative and analytical data, which are translated into both bibliometric and non-bibliometric indicators. The latter have been carefully selected and are based on objective and calibrated criteria according to the feedback provided by experts within the field.

The data search has been conducted in a composite manner: through a survey launched on January 2013 to 260 think tanks included in the ICCG Think Tank Map, as well as through the search of available data on the official websites of a selection of the most renowned think tanks, and on the websites of International Organisations responsible for climate change economics and policy (i.e. IPCC, UNFCCC, EU).

The 2012 ICCG Climate Think Tank Ranking is composed of a Global category and a European category. "Global" refers to think tanks whose headquarters are based outside the EU, and "European" refers to those based in the EU. In our analysis, the Global category does not encompass EU think tanks because they are ranked according to a more comprehensive set of indicators based on a higher number and more accurate quantitative data. Thus, they differ by number (the criteria in the Global ranking are a subset of those in the European ranking) and type (the weighting procedure is different) of assessment criteria.

Global think tanks have been assessed on a set of 5 indicators (events, authors in IPCC Reports, UNFCCC submissions, articles in peer-reviewed journals, and non-peer reviewed publications) under two main pillars, "Activities" and "Publications". European criteria encompass two additional indicators related to the specific links that may exist between EU think tanks and the European Union's research & policy strategies, i.e. the number of EU funded projects conducted by a EU think tank, and the assessment of the think tank participation in the EU consultation process.

A further distinction that has been taken into account in our analysis concerns the per capita productivity and the overall productivity of think tanks, which led to two different rankings. In the first case, two *Standardized Rankings* were built, one for the European think tanks and the other for Global ones, where all the activity

outputs of a think tank in 2012 have been standardized by the number of its researchers. In the second case, two *Absolute Rankings* were built, where all the activity outputs produced by a think tank in 2012 were considered in absolute terms in both the European category and in the Global one.

Only the Standardized rankings have determined the winners of the 2012 ICCG Climate Think Tank Ranking. The winner in the European category is the *Basque Centre for Climate Change (BC3),* and the winner in the Global category is the *Belfer Center for Science and international Affairs,* with its *Environment and Natural Resources Program*.

Congratulations to both winners of the 2012 ICCG Climate Think Tank Ranking!

## Introduction

The role of think tanks in shaping climate policies and raising awareness among the general public has become increasingly important in the last decades. The ability of a given think tank to have policy outreach is usually dependent on a variety of factors that can be divided into internal conditions (the level of technical expertise required to understand the issue, the number and the leverage of partners involved), as well as external conditions (economic interests that act as a strong driver for policy changes or pressures from the international community).

Therefore, evaluating their role in "bridging knowledge and power" is now a crucial issue. This, however, would only be possible if the direct correlation between a specific think tank's activity and a change in policy can be proved. Assessing the impact of certain ideas on a precise policy measure is often quite a difficult task, since the policy making process is the result of the collective activity of different political actors and organizations. In this context, it is only possible to evaluate the ways in which think tanks are trying to influence the policymaking process, and not the influence itself. It is reasonable that an assessment of a think tank's influence on the different public circles can be seen as a proxy of its potential impact on the final policy making process.

Regardless of the ability required to promote a particular issue, the result of a think tank's activity is also heavily dependent on the type of policy changes sought, the balance of strength among the relevant actors, and different institutional capacities.[1] This clarifies that the success of a think tank depends on internal as well as external conditions. While the internal conditions are dependent on the way every think tank is funded and managed, the external conditions that may deeply influence its activity cannot always be thoroughly assessed.

In this framework, the ICCG Climate Think Tank Ranking was first launched in 2012 with the aim to assess both the internal and external conditions in the most objective way based on analytical and quantitative data. It is the first ranking of think tanks working in the field of climate change economics and policy, and it includes the most world-renowned think tanks that specialize in climate change economics and policy.

[1] Nicola Jones, Julia Pomeres and Arnaldo Pellini with Ajoy Datta, *Think tanks in post-conflict contexts: Towards evidence-informed governance reform,* Oslo Governance Centre Discussion Papers 16, September 2009.

The remainder of the paper is organized as follows. Section 1 provides a definition of think tanks. Section 2 presents our analysis regarding the think tanks active in the field of Climate change economics and policy. Section 3 provides an overview of the literature regarding the most important think tank and university rankings. Section 4 explains the 2012 ICCG Climate Think Tank Ranking in terms of its data sources, the aim of the study, and the criteria and the methodology used. Section 5 underlines some conditions for making assessments. Section 6 examines the indicators used to analyze climate think tanks. Section 7 describes the steps that allowed us to build the ranking and in Section 8 we briefly comment on the 2012 ICCG Climate Change Ranking results.

# 1. Think tanks: a definition

Although there is already a general consensus of what a "think tank" is, defining a set of objective criteria that an organization has to comply with in order to be described as a "think tank" is not an easy task. This exercise leads to the definition of a loose set of features that describe the goals of a think tank, as well as the activities that it may carry out in order to reach them. However, this does not result in a unique and self-sufficient definition applicable to all existing "think tanks".

Defining a think tank is difficult for three reasons. The first one is that "think tanks" are considerably different in dimension, composition, structure and internal assets. Organizations with consistent funds, that employ many well-trained researchers and produce hundreds of articles and other publications every year can be described as "think tanks", as well as small organizations that have smaller resources and involve students or businessmen in a limited set of activities every year.

The second reason is that a wide variety of organizations can be described as "think tanks": this definition has been applied to private research centers, governments' bodies or political parties, consulting companies. As long as these groups conduct their research activities autonomously such as ONGs, industrial R&D laboratories, university-affiliated centers, and even private networks, they can be referred to as think tanks. Nevertheless, a definition of an independent "think tank" may apply to those that are not affiliated with academic institutions, political parties or interest groups (McGann, 2005).[2]

The third reason is the fact that think tanks engage in a large variety of activities such as: publishing papers in journals or books, organizing events open to a selected group of experts or public campaigns that involve common people and civil society organizations, developing very specific research strands, and organizing lobbying activities or public protests.

Due to these reasons, it is not an easy task to identify a clear-cut boundary between "think tanks" and other entities. Several studies have also tried to set some common criteria in order to define them (Stone, 2004)[3].

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[2] James G. McGann, *Think Tanks and policy Advice in the US,* Foreign Policy Research Institute, August 2005, p. 3.

[3] *Stone, Diane and Denham, Andrew, Think tank traditions: policy research and the politics of ideas, Manchester University Press, Manchester (UK), 2004.* See also: Steven Boucher, *Europe and*

Although the genesis of what are now commonly called "think tanks" is very heterogeneous across countries and political cultures, there is a general consensus in peer-reviewed literature that, despite these differences, all these organizations have one thing in common, which is the fact that "think tanks" are actively interested in influencing the policy makers and pushing the issues they address on the policy agenda.[4] However, as a direct correlation between a specific activity and a relevant policy, change is extremely hard to trace. It is difficult to assess the role that think tanks play in influencing the national and international policy debate (Stone, 2004).

Such an analysis is made even more difficult due to the fact, outlined above, that think tanks engage in a number of completely different activities, and that policy makers do indeed have different levels of permeability to the ideas that are pushed towards them. Logically, the ability of a think tank to bring an idea to the table of the relevant policy maker depends also on the type of government (democratic or not), on the other actors in the field (furthermore, the recent rise of multi-level governance systems has resulted in a growth of the number of the cores where policies are developed), and on the timeliness of the issue.

Lastly, looking at their evolution over time, think tanks tend to specialize as the growing competition for limited funds requires more sectoral competencies (Missiroli et al. 2012)[5]. For example, since 1980 in the United States the vast majority of think tanks that have been established are specialized. This means that these "specialty" or "boutique" think tanks focus their activities on a single issue[6], such as is the case of the 2012 ICCG Climate Think Tank Ranking, whose focus is on think tanks that specialize in climate change economics and policy.

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*its Think Tanks: a promise to be fulfilled,* Notre Europe, Paris, Studies and Research, no. 35, October 2004.

[4] The UNDP defines think tanks as "organisations engaged on a regular basis in research and advocacy on any matter related to public policy. They are the bridge between knowledge and power in modern democracies" (UNDP, 2003), while McGann refers to the term "think tank" as any organisation undertaking technical and scientific research to support policy-related analysis (McGann, 2005).

[5] Antonio, Missiroli and Isabelle, Ioannides, *European Think Tanks and the EU,* Berlaymont Paper, Issue 2, 2012.

[6] James G. McGann, Think Tanks and policy Advice in the US, Foreign Policy Research Institute, August 2005, p. 3.

## 2. Think tanks active in the field of climate change

Since 2011, the International Center for Climate Governance has been working on the Think Tank Map, an observatory on think tanks active in the field of climate change economics and policy.

In this analysis, only the think tanks working in the field of climate change economics and policy have been considered. Even in this narrow field, there are many kinds of organizations, which have different objectives, structure and scope.

The preliminary study behind the ICCG Think Tank Map has defined a set of five criteria that a research organization working in the field of climate change economics and policy should respect in order to be included in the Map:

1. It must conduct both research and dissemination activities.
2. The final objective of its activities must be a practical solution, not the simple definition of a problem.
3. Policy makers and experts must be its main targets. The general public must be involved only as a means to influence policy makers.
4. Its projects and partners list must be updated and well defined.
5. Its activities must be focused on climate change economics and policy.[7]

These points remark that a think tank must develop a series of projects that produce solid and reliable scientific research, which is essential in order to exert a powerful influence on the policy discourse through argument and analysis, and disseminate its result through various channels in order to reach the relevant stakeholders. An organization that conducts lobbying activities, or that involves only the general public acting as an advocacy group, cannot be considered as a think tank, unless it is supported by its own scientific research.

This set of criteria is supported by a definition of climate think tank, which stresses the important role they play, acting as links between research and policy through analysis and outreach: *A think tank (TT) is an independent research organization engaged on a regular basis in studying a particular issue of climate change in order to develop a broad range of policy solutions for the global warming,*

[7] The 9 research areas of the Climate Change in which the Climate Think Tank is operating had been identified through the preliminary study: *Impacts, Adaptation, Renewable energy & Energy efficiency, Policy & Institutions, Carbon finance, Climate & Development, Sustainable cities, Forestry & Land use, Water*.

*actively seeking to educate, advise or to influence relevant policy makers at both governmental and non-governmental (business) levels.*

This definition does not prevent research organizations that work on climate change as well as on many other fields from being considered as "climate think tanks". Indeed, thinks tanks working in the field of climate change economics and policy are very heterogeneous, and they span from university-affiliated centers to others at the edge of consultancy companies.

## 3. Literature on existing think tanks and university rankings

A consensus on a common methodology for assessing think tanks among the scientific community does not exist at the present time. The assessment exercises that have been made so far, rely heavily on the role of opinion surveys and experts, who only take into account limited features characterizing think tanks for their evaluation.

### a. Think tanks rankings

The first and most widespread ranking of global think tanks is based on this method. It is produced by the Think Tanks and Civil Societies Program (TTCSP) at the University of Pennsylvania's International Relations Program, led by Dr. James G. McGann. It consists of an annual report, which has been published since 2007, that ranks the world's leading think tanks. This method takes into account the opinions of a wide, carefully selected group of "experts" (including scholars, policymakers, journalists, researchers and civil society representatives) to nominate the most influential think tanks in geographic areas or in thematic fields. The number of nominations that a think tank receives determines its position in the final ranking. This ranking usually receives great coverage from the media and is well-known among researchers; however, every year it draws some criticism concerning mainly its lack of scientific method, lack of control of the institutions, and generally the ranking can be considered as a "popularity" contest more than a list of organizations based on the quality of their research output.

The Prospect Think Tank of the Year Awards, founded in 2001 by the British Prospect Magazine, uses a similar method to rank think tanks. Every year they run a contest for think tanks judged by a panel of experts. The awards are judged by a cross-party panel looking for evidence of influence both on public policy and on public discourse. The judges also consider the quality of research and the potential of younger and smaller organizations. However, in this case, for each think tank they evaluate only a single outcome, such as a publication, a project

or an initiative. Although this method is simpler, since it requires less data, it is clear that assessing an entire institution over a single outcome is insufficient to obtain a clear understanding of its true potential.

The existing think tank rankings based only on opinion surveys among a group of experts, albeit wide and various, are considered faulty due to their subjectivity. They also receive a lot of criticism for not taking into account the effective quality of the research of a think tank and its role in influencing policy.[8] Therefore, an assessment methodology that can be as objective as possible is needed, which explains the purpose of the 2012 ICCG Climate Think Tank Ranking.

### b. University rankings

The main rankings of the best global universities face a major criticism: international rankings only cover a very small percentage of the world's 17,000 universities, between 1% and 3% (corresponding to 200-500 universities). This means that the ranking cannot be considered an assessment of the quality of the academic institution, but simply a ranking producing global league tables. Such a ranking cannot be considered comprehensive and cannot produce stable results for more than around 300 universities in rankings specialized in a specific subject area.[9]

Moreover, the most international rankings predominantly focus on indicators related to the research function of universities. Measuring the quality of teaching and learning generally undertakes the use of proxies, often with a very indirect link to the teaching process, with the result that these rankings are rarely effective. The link to external stakeholders and environments, such as the participation in international exchange programs is largely ignored, whereas reputational factors tend to have disproportional importance in many cases. The ratio between the number of students per professor is one of the few reliable indicators used by some university rankings.

There are four renowned global university rankings. The first and the oldest is the *Shanghai Academic Ranking of World Universities (ARWU)* which was first established in 2003, and has been updated annually ever since, under the Chinese original project to benchmark the top Chinese universities with US research universities. This ranking was conducted with the aim to reverse the

[8]Jan Trevisan, "2011 Global Go To Think Tank Rankings": an analysis, ICCG Reflections, February 2012; Enrique Mendizabal, *And the winner is: Brookings … but, once again, the loser: critical analysis*, blog post, January 2012; Seiler, Christian and Wohlrabe, Klaus, *A critique of the 2009 Global Go-To Think Tank Rankings*, CESifo DICE Report, 2010.

[9] *Andrejs Rauhvargers, Global University rankings and their impact, European University Association Report on Rankings 2011, p. 7 and 13.*

Chinese students' brain drain in response to a statement made by the then President of the People's Republic of China, Jiang Zemin, that China must have a significant number of top, world class universities[10]. Today, ARWU's main purpose is to produce league tables of the top universities (it only considers around 1000 universities of which the first 500 are ranked in the league table of the world's top universities), it only concerns research performance, and it is based on bibliometric indicators. ARWU compares the overall strength of a university; indeed all but one indicator (i.e., per capita performance) are based on absolute numbers (e.g. the number of alumni and staff winning Nobel prizes, the number of staff included in the lists of most highly cited researchers, number of papers published in Nature and Science), thus favoring large universities. [11]

The second most popular ranking is the *Times Higher Education World Universities Rankings (THE)*, initially conceived as a response to the Shanghai ARWU ranking, in cooperation with Quacquarelli Symands (tHE-QS), and since 2010 in cooperation with *Thomson Reuters (THE-TR)*. The latter is based on both bibliometric (having the greatest share of the overall weight: 37%) and non-bibliometric indicators (still reputation surveys on research and teaching account for more than one third of the overall score: 34.5%; income indicators 10.75%; importance of PhD studies 8.25%; internationalization indicators 5%; and student to staff ratio accounting for 4.5%). THE-TR can be considered a research oriented ranking. It should also be noted that since all output indicators are standardized (for the number of staff, of publications, etc.), the ranking score is not size-dependent. The main purpose of THE-Thomson Reuters Ranking is also to produce league tables of top universities, excluding graduate schools, and those that have not provided data.

The third most popular ranking is the *Taiwan Higher Education Accreditation and Evaluation Council University Ranking (HEAACT), which* concentrates on research performance and whose output is also a league table based on a composite score, but concentrating on bibliometric indicators only. Although HEEACT does not rank all universities in the world, it does consider the 700 top universities for its overall university ranking and around 500 top universities for each subject field. HEEACT attempts to compensate for the size of a university, unlike ARWU, and indeed 50% of the indicators are standardized for the number of researchers.

The fourth most popular ranking is the *World's Best University Ranking - US News and World Report* in cooperation with *Quacquarelli Symonds (tHE-QS),* which was

[10] *Nian Cai Liu, The story of academic rankings. International Higher Education, No. 54, 2-3 Winter 2009.*

[11] *Idem, p. 70.*

founded in 1990. Its main mission is to produce university league tables and thus can be considered a global provider of higher education and independent research. Its activities focus on over 2,000 international universities and business schools. It is similar to THE-TR not only because it uses similar methodology, but also because it is based on both bibliometric and non-bibliometric indicators.

Other than these four most famous rankings of academic institutions, there are other university rankings or classifications not aimed at producing league tables, such as *Webometrics, which is* based on the degree of visibility on the web; *U-Map* is based on a number of indicators with no intention of producing league tables, but only comparing universities that have similar profiles; *EU U-Multirank*, an EU-funded project which aims to respond to the main criticism moved towards the international rankings. According to the EU objectives, this ranking should be multi-dimensional covering the missions of all universities such as education, research, innovation, internationalization, outreach, and independence , thus not to be run by universities themselves.

Finally, it is worth mentioning the Spanish Scimago Institutions Rankings (SIR) which also does not produce a league table, rather it aims at being acknowledged as the most comprehensive ranking of worldwide research institutions and is based on bibliometric indicators. It embraces all institutions that have significant scientific output, spanning from universities to national research laboratories and even health research centers according to five Institutional Sectors.[12] With the aim to assess their research performance, SIR uses several indicators, the most relevant being the "Normalized Impact – NI." For instance, NI values relate the citations that an institution receives by comparing them to the world average, which is equal to one. That is, an institution having an NI of two can be considered as having twice the scientific impact as the world average. Other quantitative indicators used by SIR are the Q1 indicator - assessing the institution's ability to put its scientific production within the best scholarly and most influential journals as ranked by the Scimago Journal Rank indicator, the Excellence Rate and the Specialization Index.[13]

[12] Higher Education, Health System, Government Agencies, Corporations and Others.

[13] *Scimago Institutions Rankings, SIR World Report 2011: Global Ranking, Scimago Research Group, 2011. The SIR 2011 edition includes more than 3,000 institutions that together are responsible for the 80% of worldwide scientific output during the term 2005-09 as indexed in Elsevier's Scopus database.*

## 4. The first edition of the ICCG Climate Think Tank Ranking

The ICCG Climate Think Tank Ranking is the first to rank think tanks working in the field of climate change economics and policy. The 2012 edition is the first one and we should acknowledge that while initially it was meant to encompass data from a three-year period (2010 - 2012), due to the difficulty to find available data for such a time frame, it has been limited to one year only: 2012.

The 2012 ICCG Climate Think Tank Ranking is composed of a Global category and a European category. "Global" refers to think tanks whose headquarters are based outside the EU, and "European" refers to those based in the EU. In our analysis, the Global category does not encompass EU think tanks, because they are ranked according to a more accurate and comprehensive set of indicators based on a higher number of quantitative data. Thus, the separation into the two categories does not mean that the think tank's research activity is focused on a country or region-specific climate change research issue, rather it differs by number and the type of assessment criteria (the criteria in the Global ranking are a subset of those in the European ranking). Indeed, European criteria encompass two further indicators related to the specific links that may exist between EU think tanks and the European Union's research & policy strategies. For instance, the number of EU funded projects conducted by an EU think tank, and the subscription to the EU Transparency Register, which allows the think tank to take part in the EU consultation process.

The 2012 ICCG Climate Think Tank Ranking is based on quantitative and analytical information and on both bibliometric and non-bibliometric indicators. Data search has been conducted in a composite manner: through the launch of a survey in January 2013 to the 260 think tanks included in the ICCG Think Tank Map as of 15th December 2012, and where the reply to the survey was missing through the search of available data on the official websites of a selection of the most renowned think tanks, as well as on the websites of international organizations responsible for climate change economics and policy (i.e. IPCC, UNFCCC, EU).

As further illustrated below, the indicators that have been carefully selected since 2012 by the ICCG Think Tank Map team are based on objective and calibrated criteria according to the feedback provided by experts within the field. They have proved to be very useful in providing more objective and transparent information on the effective activities carried out by think tanks (e.g., organized conferences and seminars, participation in EU-funded projects, UNFCCC submissions, participation in the IPPC reports, and in the EU Public consultations process).

Moreover, the indicators used for the 2012 ICCG Climate Think Tank Ranking are based on the criteria of per capita productivity of each think tank. According to this criteria, all the activity outputs of a think tank chosen as indicators have been standardized with respect to the size of the think tank, according to the number of its researchers. The same indicators can be used differently to assess the overall productivity of the think tank. The overall productivity of a think tank is the total number of outputs that a think tank produces during a certain period of time, such as, for example, the total number of scientific citations of its papers, or the total number of conferences organized. Comparing productivity in absolute terms could be used to assess think tanks in reference to the extent of their work's impact on the public. The resulting values, however, would be independent from the size of a think tank, its age or its funding.

It is indeed reasonable to consider that better funded think tanks are able to employ a higher number of researchers, which produce more outputs that have the capacity to reach a wider public and exercise a better influence on policy makers. In this situation, both the small and large (by number of researchers) think tanks would have unequal conditions.

On the contrary, per capita productivity of a think tank is preferable, as it privileges efficient think tanks, that can "do more" by exploiting the resources they have. In this sense, also smaller think tanks could result in the top ranking positions.

Bearing this in mind, we have built two types of rankings. The first is referred to as *absolute ranking, which is* based on the think tank's overall productivity to show that larger think tanks will result among the first ranked according to their actual output. The other is referred to as *standardized ranking, which* is based on per capita productivity standardized by the number of researchers. .

Our methodology aims, therefore, to highlight the most efficient in terms of per capita productivity and not just the "best" think tank. The ICCG Climate Think Tank Ranking can be considered innovative not only because of this approach, but also because it is the first think tank ranking to base its methodology on quantitative and analytical indicators, thus resulting complementary to rankings built on opinion surveys. In order to evaluate a think tank and to build a ranking based on quantitative and analytical information, the evaluation must be conducted only on the basis of the information, which is directly transferrable into numbers. This means that it is possible to transfer the outputs and the activities of a think tank into quantifiable indicators that can be combined into a final score. An example indicator to evaluate outputs is the number of events or publications (policy briefs, papers, books) produced during the last year, in this case 2012.

Therefore, this methodology allows evaluating the measurable features of a think tank, such as the quality of its research, as well as the extent of its dissemination efforts. The quality of these features must be considered a proxy for the overall quality of the impact that a think tank can have on the policy making process.

Given these constraints, the general strategies to evaluate a think tank usually take into account two factors: the academic and the non-academic impact. The academic impact results from its research activity; it is usually evaluated by analyzing the scientific production of a think tank, both qualitatively and quantitatively. On the other hand, the non-academic impact identifies the influences of research findings on policy, managerial and professional practices, social behavior or public discourse. Such an impact may be instrumental, influencing changes in policy, practices and behavior, or conceptual, changing people's knowledge, understanding and attitudes towards social issues (Davies, 2005)[14]. The 2012 ICCG Climate Think Tank Ranking has focused its attention both on the academic impact through the bibliometric indicators, and also on the influence of think tanks on policy, through non-bibliometric indicators, such as, for example, the number of UNFCCC submissions, the participation in the IPPC reports and in the EU Public consultations process.

Finally, a coherent ranking should collect all the information regarding a think tank and make it public, along with the methodology used for ranking think tanks. This kind of analysis is the most transparent when it is conducted on publicly available data. All of the ICCG Climate Think Tank Ranking data, both those collected through the survey and through the search on the think tanks' official websites, are transparent, publicly available and verifiable.

However, given that think tanks are various and heterogeneous in nature, the level of transparency and availability of precise information varies considerably from one think tank to the next . Think tanks that display information on their activities and internal structure in well-organized and clear websites as well as annual reports are of course privileged with respect to those whose information was not publicly available and could therefore not be taken into consideration for our ranking. The resulting ranking is therefore greatly affected by data availability and verifiability concerns.

[14] Davies, H., S. Nutley and I. Walter, *Assessing the impact of social science research: Conceptual, methodological and practical issues*, Research Unit for Research Utilisation, University of St. Andrews, 2005.

## 5. Conditions for assessment

The ranking of think tanks needs to be based upon objective indicators comparing think tanks on the basis of features that are common to all. Since think tanks greatly differ in scope, scale and resources, finding common parameters to evaluate and rank all climate think tanks in the world is a difficult task. In order to make the assessment on the same grounds for all the entities considered, further conditions have to be defined.

### a. Only think tanks working at the international level will be assessed

Comparing influence on domestic policy makers poses great challenges, as interaction between think tanks and policy makers in each country is subject to a host of context-specific variables. Secondly, think tanks active in different parts and countries of the world use different channels to disseminate the results of their research and to influence the public. Those channels are almost impossible to compare; it is consequently very difficult to define their relative importance and ability think tanks coming from different countries to exploit them.[15] In addition, there are considerable linguistic barriers to accessing information regarding domestic policy-making and related research, as these documents are written in many different languages.

In this connection, the comparative assessment of climate think tanks around the globe is possible only narrowing down the selection to the think tanks that use a common set of channels to disseminate the results of their research, share information and connect with policy makers. The adopted solution is to consider only the think tanks that work at the international level, participating in international climate change research and advocacy activity (in addition to the local one). In this case, only common channels for disseminating knowledge will be considered, making it possible to build a ranking among think tanks working in many different parts of the world.

Narrowing further the selection of think tanks, the European category of the ICCG Climate Think Tank Ranking considers a specific geopolitical area, such as the European Union. This would make the evaluation even easier, since think tanks in the same region tend to use common platforms to share information, access funding and build partnerships and networks.

[15] For example, how is it possible to assess which scientific journal or TV channel through which think tanks in two very different countries are disseminating their ideas is more important? This task becomes even more complicated when the evaluation has to be extended to all the climate think tanks in the world.

### b. The ranking must be based upon coherent and checkable data

The ranking must be built around comparable features and should take into account concerns regarding data availability (i.e. whether it will be possible to get the required information for every think tank). To avoid criticism, the ranking also needs to be transparent and based upon reliable data. So as it was already observed, if on the one side think tanks have been asked to provide information for the ranking through a survey, on the other hand when the survey had not been filled in, the relevant information were found by the Think Tank Map team through a web search. It is imperative that this information be verifiable whatever is the source of data collection. This verification may be carried out by making reference to public sources, such as reports and web pages.

As we have already observed, the reference period for the data search is year 2012, although when the survey was launched it was decided to consider the three-year period from 2010 to 2012. Since data need to be reliable and easily checkable then the search was tightened to one year only.

## 6. Indicators for analyzing climate think tanks

In this section, a list of indicators to evaluate the activity of a think tank taking into account the constraints presented up to now will be presented.

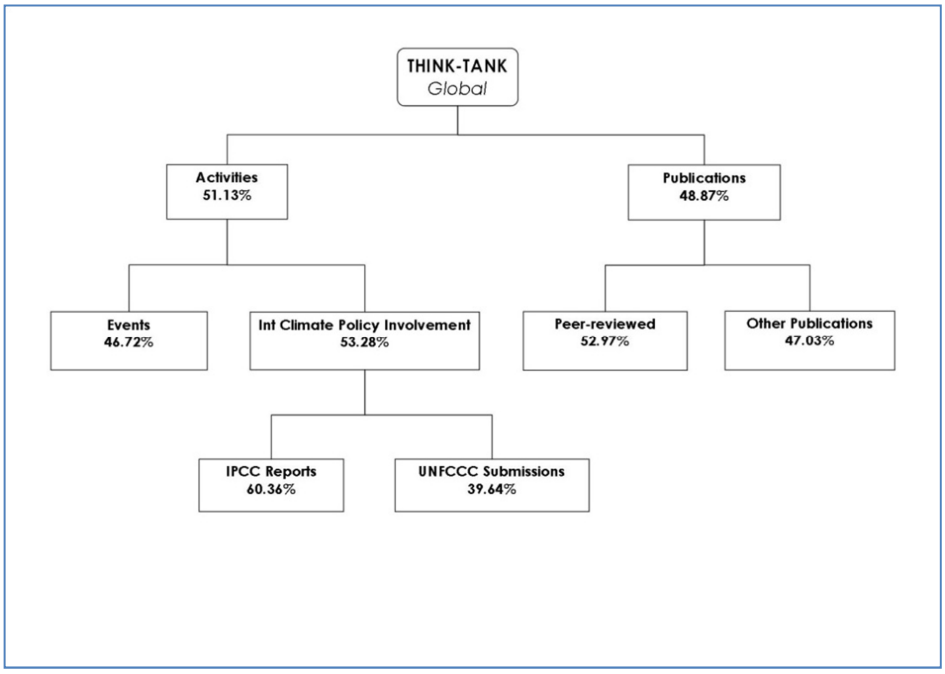
As we have already observed, the two rankings – Global and European - differ by the number and type of criteria (the criteria in the Global ranking are a subset of those in the European ranking) and by the weights assigned by expert to those nodes of the decision tree that are not in common[16].

These reasons make incomparable the two rankings because the aggregation process is different; the data set of European and Global think tanks are kept separated and hence two independent rankings are built.

#### *Global ranking*

This ranking includes the think tanks working in the field of climate change economics and policy with headquarters outside the European Union. Think tanks have been assessed on a set of 5 indicators (events, authors in IPCC Reports, UNFCCC submissions, articles in peer-reviewed journals, and non-peer reviewed publications) under two main pillars, "Activities" and "Publications".

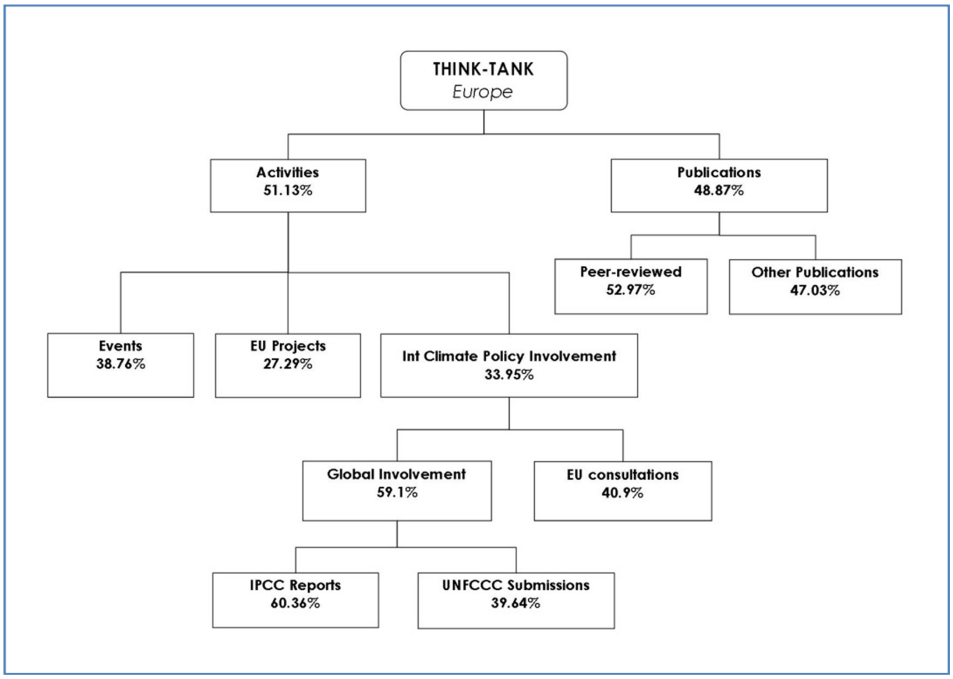
[16] See section 7 "Results"




### *European ranking*

This ranking includes the think tanks working in the field of climate change economics and policy based in the European Union.

Think tanks have been assessed on the basis of 7 indicators (events, authors in IPCC Reports, UNFCCC submissions, articles in peer-reviewed journals, and non-peer reviewed publications, EU projects, EU consultations) under two main pillars, "Activities" and "Publications".



The reason behind a double ranking is that EU-based organizations differ from the non EU-based ones in that they can benefit from EU-specific programs – such as the European Commission's *Framework Programmes* – from funding mechanisms that support collaborative, trans-national R&D, and they have the opportunity of shaping the EU policy through e.g. the participation in EU Public consultations.

All the indicators below are referring exclusively to climate-related activities. Albeit general, this definition includes all the sectors in which climate think tanks are active (agriculture, development, energy, transports, etc.) and excludes automatically some non-relevant fields (non-climate related policy, security and military analyses, gender issues, and so on). Since climate change is interdisciplinary by definition, events that are referred to different thematic areas has not been considered separately.

Indicators are grouped into two main pillars, "Activities" and "Publications".

## a. Activities

### Events

Indicators in this section take into account the events organized by the think tanks.

Events have a primary importance for think tanks, as through events think tanks can disseminate their research and ideas, make themselves known among a relevant audience, and attract visibility from the general public and the media.

Think tanks organize different kind of events, that vary according to the type of public addressed (general or specialist public), the number of speakers, the possibility for external researchers to give presentations, as well as the content. In general, there is not a consensus among think tanks on the term "events", as it is used to identify activities with different formats and involving a diverse public. For the sake of the Climate Think Tank Ranking the ICCG has drafted the following definitions, in order to avoid any possible misunderstandings:

- *Lecture*
  Event in which a single keynote speaker presents a certain topic to the wide public. Might be followed by a Q&A session or a press conference.
- *Conference*
  Prearranged meeting for consultation or exchange of information or discussion, usually with a formal agenda. It features keynote speakers and

speakers chosen through a call for papers, and is usually attended by specialists.

- *Seminar*
  Educational event that features one or various experts delivering information to a selected public (academics, business and other stakeholders).
- *Workshop*
  May have various speakers, who can be selected through a call for papers. It is open to a selected audience, and is usually followed by a plenary discussion or a debate into working groups.
- *Forum*
  Meeting attended by high-level stakeholders, focused on presentations and discussion. It generally covers a particular issue, is organized periodically (usually, once a year) and may take more than one day.
- *Non-academic event*
  Every event that does not imply the dissemination of scientific research. Its aim is to mobilize the general public, convey a message or an idea, and generally is targeted to a wide public (e.g. film screenings, training courses, public demonstrations, volunteering campaigns).

The analysis of events is important for the reason that such circumstances represent the most concrete occasions for think tanks to enter in contact with the public they want to address. Organizing an extensive number of events can be seen as a proxy of the ability of a think tank to present its ideas to the audience it is trying to influence.

The indicator used to assess events is the following:

*Aggregated number of events targeted to specialist public and events targeted to the general public organized in the last year (2012)*

This indicator represents the ability of a think tank to attract all the layers of society. At the bottom level, think tanks are able to make their ideas available to a wide public: by doing so, they aim to raise awareness on certain subjects and push their views to the people who will, in turn, play an important role in pressing the policy makers to reshape the policy agenda or to plan concrete actions. Thus, through influencing directly the general public, think tanks are able to exert indirect influence on the policy makers.

By involving the upper levels of society in their events, think tanks are able to disseminate their vision and the results of their research to people directly involved into the policy process, providing the scientific basis to guide their decisions.

**Data transparency**: In order to attract a wide public, think tanks make full use of all the channels available to them to disseminate the information about the events organized. Usually, the data used to value this indicator can be found on the website of every think tank.

### EU projects

This indicator considers the involvement of European think tanks in projects in the research framework led by the European Union. Think tanks that are able to better exploit the opportunities offered by the European Union are most likely the most widely-known in the European R&D world, whose excellence in research is recognized by all the European actors in the field.

The indicator in this section is the following:

> *Number of EU research projects a think tank has taken part in or has coordinated as a partner and that are ongoing in the last year (2012). (This indicator has been used for the European ranking only).*
>
> The European Commission finances periodically a series of R&D projects in various fields through the *Framework Programmes*. The procedures to take part in a project are very strict, and the applying institutions undergo a strict quality assessment before they are assigned their share of a project. Consequently, the fact that a think tank is active in EU-funded research projects can be seen as a proxy for the excellence of its research.

**Data transparency:** for transparency reasons, the EC discloses non-sensitive information about participation in EU-funded projects on the CORDIS (Community Research and Development Information Service) platform. Information about think tanks' involvement in research projects is a checkable data through the new EC search engine.[17] Since the only verifiable EU projects through this search engine are those belonging to the 7th Framework Programme, these are the only ones that have been taken into consideration under this analysis.

[17] http://cordis.europa.eu/projects/home_en.html

**International climate policy involvement**

Indicators in this section consider think tanks' involvement in the most authoritative organizations dealing with climate change, the IPCC and the UNFCCC treaty bodies.

An indicator included in this section considers also the direct involvement of a think tank in the EU policy making process through taking part in public consultations at the EU level.

The fact that a think tank is involved in outstanding international events and discussion *fora* is considered as a sign of its ability to play an active role among the most authoritative actors in the field of climate change economics and policy. It is a sign of international recognition, of the capacity to build relevant links and connections, and to address directly the policy makers at the highest possible level.

The indicators in this section are the following:

*Number of fellows of a think tank who are authors and/or editors of IPCC reports ("IPCC Reports"). In this year ranking the IPCC Report that was taken under consideration was the AR5.*

Engagement with the IPCC is regarded as a proxy to assess the visibility of think tank members in the most authoritative scientific body dealing with climate change. It is also a sign of the ability of a think tank to attract the most authoritative scholars in the field.

**Data transparency**: the list of people involved in writing the IPCC reports can be found on the IPCC website[18], while their affiliation with a certain think tank can be easily confirmed through that think tank's website.

*Number of submissions to UNFCCC treaty bodies in the last year (2012) ("UNFCCC Submissions")*

Submissions are texts that all think tanks are able to provide to the UNFCCC treaty bodies, containing inputs and contributions on various issues. Through this procedure, think tanks have the effective possibility to bring their demands and recommendations directly to the eyes of the negotiators. The

[18] Working Groups' members can be found at the following addresses, respectively for WG1, WG2, and WG3:
https://www.ipcc-wg1.unibe.ch/AR5/wg1authors.pdf;
http://www.ipcc-wg2.gov/AR5/WGII-AR5_Authors.pdf;
http://www.ipcc.ch/pdf/press-releases/ipcc-wg3-ar5-authors.pdf

number of submissions to the UNFCCC treaty bodies is regarded as a proxy for a think tank's attempts to influence the most important global climate policy-making forum.

**Data transparency:** submissions are public, and the updated list of submissions is available on the UNFCCC website.[19]

*Is the think tank among the organizations registered to respond to EU public consultations? ("EU Consultations" - This indicator has been used for the European ranking only)*

The EU runs regularly public consultations, asking the public's input to provide their advice on rules and regulatory proposals. All citizens and organisations are usually welcome to contribute to public consultations, as long as they are accredited and included in the Transparency Register. The register provides citizens with a direct and single access to information about who is engaged in activities aiming at influencing the EU decision making process, which interests are being pursued and what level of resources are invested in these activities. The fact that a think tank is listed in the Transparency Register is a proxy of its active engagement in shaping the EU policies.

**Data transparency:** There is a specific page in the Transparency Register with all the public consultations on climate change.[20] Not all the results for all the consultations are disclosed (in some cases, only statistics are available), but the information about organizations listed in the Transparency Register are presented clearly.

### b. Publications

#### Peer-reviewed articles

Think tanks use different kinds of publications to spread their ideas, such as newsletter, books, journal articles, reports, and policy briefings. All of these are important channels to disseminate research, and one of the main outputs of the activity of a think tank.

Every type of publication is targeted to a different group: for example, newsletters and articles in newspapers are targeted at both experts and the general public, and are usually used to inform about the think tank's activities and to raise awareness by highlighting the most important issues. On the other

[19] http://unfccc.int/parties_observers/ngo/submissions/items/3689.php
[20] http://europa.eu/transparency-register/index_en.htm

hand, policy briefings are targeted at assessing in-depth specific issues, while giving practical advice to policy makers on the need to consider a particular policy alternative or course of action. Policy briefs aim directly at influencing the target audience, convincing them of the need to act in a specific way.

The academic audience is reached by working papers and journal articles. Working papers are published by think tanks to inform about the latest results of their research and their most recent findings. They can be spread around in paper or in digital versions, usually downloadable for free on the think tanks' websites. The choice to make working papers available for free extends greatly the audience that can be reached.

Journal articles are papers published in peer-reviewed journals. The process of peer-review, that involves the assessment of an article by a panel of experts in the field, ensures that the papers published represent the best scholarship available at the time of writing. Consequently, the fact that a text produced by a think tank is published on such literature is both the sign of a high-level expertise among of the authors and recognition of the quality of the research undertaken by the think tank.

An analysis of publications can assess a think tank's ability to produce timely and authoritative research. Evaluating the research of a think tank is important, because for a think tank excellence in research ideally leads to a higher involvement in dissemination, participation in national and international projects, better founding by external actors, a higher rate of consultancies, etc. In general, there are two possible ways to assess these printed outputs: qualitatively, by assessing the overall quality of the publications of a single think tank, or quantitatively, by relying on the existing analytics. For the sake of building the ICCG Climate Think Tank Ranking, the qualitative analysis of publications is not recommended, for two reasons:

1. *A qualitative assessment would take a lot of time and efforts.*

   The production of a think tank is usually very ample. It would be a long task to read all the publications and to assess them. Furthermore, there is the need for the persons who conduct the assessment to have a proven knowledge of the issues in the various fields where think tanks are working.

2. *A qualitative assessment would be inevitably biased.*

   The persons leading the assessment would inevitably put some bias in their analysis. The resulting analysis would not reach the levels of objectiveness required for such an exercise.

The only possible option is to analyze the publications of a think tank quantitatively, using the existing analytics and bibliometric indicators to assess their publications. Consequently, the analysis of the publications of a think tank would need to take into account only the publications on which such metrics can be applied.

Lubrano et al. (2003)[21] suggests that "*the main difficulty is that it seems difficult to say on a priori grounds if a book is good or not, while it seems easier to say that an article is published in a good or in a bad journal*", and moreover it is also quite hard to quantify factors such as publications in a conference proceedings in different fields, the academic influence of a project, and consultancies provided by a think tank. Therefore, in order to build the ranking, research outputs are measured by analyzing the publications of individual researchers in peer reviewed journals, since the publications in distinguished journals, that undergo a certain level of quality control based on anonymous reference, can be seen as a proxy of the overall quality of the research of a think tank.

Furthermore, peer-reviewed journals are included into the major citations databases e.g. Web of Knowledge (Thomson Reuters), Scopus (Elsevier), and all the widely-used bibliometrics are referred to them. Books have been excluded in this analysis, for the reason that they are only partially included in the above mentioned databases: probably, in the future, an analysis of books will be possible, as the biggest databases are gradually considering more and more of them. Other publications, such as newsletters, reports or articles in newspapers, have not been assessed. Working papers and Policy Briefs, however, have been assessed in the second indicator of this section.

The following indicators have been used to evaluate publications:

- *Score given on the basis of the analysis of the articles published in peer-reviewed journals in the last year (2012).*

Think tanks have been asked to provide the list of articles published in peer-reviewed journals in the last year. For every article, the following information have been required:

a. Title of the paper;
b. Journal where it was published.

The following information have then been extracted:

- How many papers has each think tank published in every journal.

[21] Lubrano, Michael et al., *Ranking Economics Departments in Europe: a statistical approach,* Journal of the European Economic Association, 1(6), 2003.

In this way we have assessed not only the overall productivity, in terms of peer-review publications, but also the research-quality of each think tanks in the last year.

To assess the quality of a journal, two approaches have been used in the literature: the analysis of the *direct impact* of an article, and the *indirect impact*, which uses journal weights as a proxy for the future accumulation of citations. The direct impact of a paper can be assessed by counting the number of citations that it accumulated over time[22]. An alternative to direct impact is to evaluate the possible impact of an article being published by analyzing the prestige of the journal where the research has been published. In order to assess the relative importance of peer-reviewed journal articles, the analysis proposed here has relied upon bibliometric indicators.

Bibliometric indicators are needed because of various reasons. First, using the above mentioned *direct impact* method, which implies just counting the citations, would not be a good method: given the fact that the issue of climate change is interdisciplinary, researchers publish their work in journals in different fields that have different citation traditions[23]. Moreover, the trend of citations, not only among different fields but also within field varies extensively[24]: counting citations of publications would favour some publications in the field of natural sciences against those published in the field of social sciences, for the reason that some research fields accumulate citations in shorter horizons when compared to others[25]. Therefore, counting direct citations of researchers' work within a specific period would give biased results depending on the concentration of the publications in different fields that a think tank produced. Given the limitations and shortcomings of the direct citations in the period of evaluation as discussed above, the excellence of the research produced by a think tank is evaluated with the use of weights given to each journal, depending on journal's impact.

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[22] In a similar way, the H-index measuring the papers published by a researcher received a *h* level of citations, total citations accumulated by a researcher.

[23] Centre for Science and Technology Studies (2007) suggested that in the social sciences and humanities, the number of citations is generally an order of magnitude lower than in the natural and medical sciences. For some social sciences and most fields in the humanities it may be desirable to use a considerably longer citation window (e.g. 5-6 years) than in the natural sciences and medical fields (3-4 years) since the flow of citations in social sciences lags its publication date.

[24] Centre for Science and Technology Studies (2007) also finds differences in orientation within the social sciences and humanities, and publication and citation characteristics may vary widely among the different fields.

[25] For example, on average, citations accumulated by a publication in the field of biological sciences within the year of its publication is 3-4 times higher than a publication in the field of economics would have accumulated within the same period. Furthermore, the average time that takes an article in the journal to receive half of its citations also varies extensively among different fields; see Thomson Reuters Science and Social Sciences Citation Index.

Various researchers have studied methods to assign weights to journals with respect to their prestige, focusing especially on the most respected journals. (e.g., Burton and Phimister, 1995; Kalaitzidakis et al. 2003; Kalaitzidakis et al. 2011). The most common measure used until now is the *impact factor*, linked closely to the number of citations that a paper accumulates over a specific timeframe.[26] The impact factor of a journal is considered to be a good proxy for the amount of citations that a paper published in that journal will be accumulating in the near future. However, there has been major criticism on the use of the impact factors as journal weights for various reasons: first, impact factors do not account for citation patterns in different fields; second, they does not account from which journal citations comes (i.e., all citations from any sources are accounted evenly); and third, they cover a limited window for citations, in which some fields have higher immediate citation tradition whereas in some other fields citations takes place after a longer period greater than the window itself[27].

For this reason, this analysis has not considered *impact factors* as the values used to weight the indicators. Instead, the metrics used has come from the Eigenfactor Algorithm, that uses the structure of the entire network of citations to evaluate the importance of each journal. West et al. (2010)[28] clarifies that the strength of Eigenfactor lays in the fact that it does assess differently a citation from a top-tier journal and one from a journal that is rarely cited by anyone. Furthermore, it accounts for the intensity of citing journals[29] and avoids self-citation patterns, exploits all citation networks without separation of fields (i.e., one can account which field is more integrated to the scientific committee)[30]; on the contrary, it adjusts for citation differences across disciplines. Because of these reasons, Eigenfactor is more suitable for analyzing papers and journals than other bibliometric indicators, such as the H-index.

[26] The two-year and five-year impact factor of a journal is calculated by counting the citations that a journal received to its publications in the last 2 years and in the last 5 years divided by the number of papers published by that journal in 2 and 5 years respectively.

[27] See Amin and Mabe (2000) for a detailed discussion.

[28] Jevin D. West, Theodore C. Bergstrom, and Carl T. Bergstrom, *The Eigenfactor Metrics: A Network Approach to Assessing Scholarly Journals,* 2010

[29] The gap between science and social science edition journals are decreased but there still exist major differences. Since the AIF accounts for the citation intensities from the citing journal, avoids self-citations and considers the amount of articles being published by a journal, those differences are mostly because the natural sciences have a better network in the scientific world than the social sciences.

[30] See Franceschet (2010) for a detailed discussion on the reasons to use Eigenfactor metrics in practice.

The Eigenfactor Algorithm produces two metrics:

- *The Eigenfactor score*[31] considers the number of citations received by a journal (excluding self-citations) and, following Google's Pagerank Algorithm, computes a score that represents the influence of that certain journal as a whole.
- *The Article Influence Score (AIS)* is derived by the Eigenfactor score (dividing it by the number of articles published in the last 5 years), and is a measure of the per-article citation influence of the journal.

In order to compile the ICCG Climate Think Tank Ranking, the metric used has been the Article Influence Score, for the reason that it is explicitly paper-based, not journal-based as the Eigenfactor Score.

*Thompson Reuters' Web of Science* (Journal Citation Reports[32], Science and Social Science Editions) has been used to find the information about authors, papers and journals that has been used for the evaluation of a think tank. The AIS score has been extracted from the same source as well.

Generally speaking, the most authoritative journals dealing with climate policy are included in the Web of Science. However, the problem of climate change lies in the fact that it is a truly multidisciplinary field: articles related to this issue can be published among many different fields, such as natural sciences, law, international relations, climatology, water studies, sociology, and so on. Although the Web of Science – Journal Citation Reports consists of a huge database of journals, it covers only a selection of academic journals. Research dealing with social sciences and humanities is especially underrepresented in existing citation indexes and databases, and this could limit the coverage of all the journals dealing with climate change. However, it seems clever to use it anyway, as it is probably the most comprehensive bibliometric database in the world, it is highly regarded in the scientific community and it is widely used for similar exercises.

Furthermore, there are *no "ready-to-use"* lists of journals publishing articles related to climate change that can be used for the purpose of analyzing where excellent think tanks publish their research. The existing experiments provide some

[31] The complete method is described here: http://www.eigenfactor.org/methods.pdf.

[32] Thompson Reuters provides services such as Journal Citation Reports and Web of Science where by using the former, 2-year and 5-year impact factor, Eigenvalues and Article Influence Factors of the journal can be obtained whereas by using the latter, one can obtain each researcher's total accumulated citations to their papers and h-index of a given researcher.

interesting ideas, but do not adequately capture publications dealing with climate change policy;[33] consequently, adequate metrics are not provided.

The journals considered for ICCG Climate Think Tank Ranking, have been extracted through the categories in the Science Citation Index and the Social Sciences Citation Index of the Web of Science. All the journals in the following categories have been selected:

From the Science Citation Index:

- Agricultural Economics & Policy
- Agriculture, Multidisciplinary
- Agronomy
- Biodiversity Conservation
- Biology
- Computer Science, Interdisciplinary Applications
- Ecology
- Energy & Fuels
- Engineering, Environmental
- Environmental Sciences
- Food Science & Technology
- Forestry
- Geography, Physical
- Geosciences, Multidisciplinary
- Limnology
- Marine & Freshwater Biology
- Meteorology & Atmospheric Sciences
- Multidisciplinary Sciences
- Oceanography
- Paleontology
- Public, Environmental & Occupational Health
- Soil Science
- Transportation Science & Technology
- Water Resources

[33] Rousseau et al. (2009) proposed a methodology that uses "TOP-curves" to rank 12 papers in the field of environmental and resource economics. The methodology described could be theoretically deployed to produce a ranking for our purposes, but a lot of information would be need to be collected; this task would entail a lot of work to be carried out by specialized personnel.
Other experiments, such as Thomson Reuters' Science Watch "Top 20 Journals - Climate Change (http://sciencewatch.com/ana/st/climate/journals/) include only a limited number of journals, or are based on personal opinion and dominated by natural sciences publications. See Jim Prall's (http://www.eecg.utoronto.ca/~prall/climate/journals.html) and Aki Jokimaki's list (http://agwobserver.wordpress.com/2010/04/09/climate-science-journals/).

From the Social Sciences Citation Index:

- Economics
- Environmental Studies
- International Relations
- Public Administration
- Urban Studies

Journals that are not included in Eigenfactor, and thus do not have an AIS value, have not been considered.

Another issue with bibliometrics is that they favor think tanks that publish in English. However, this does not represent a problem in this assessment, as only the think tanks working on the international level (Global or European) will be assessed.

*Methodology*

The methodology to produce the final value for the indicator based on peer-reviewed journals has been based on a Scoring Rule approach (Marchant 2009)[34], that by taking into account the number of articles and their respective *AIS* journal, returns for each think tank the overall quality and productivity of peer-review publications (measured as the sum of all AIS's journal where they published in the last year).

**Other publications**

*Does the think tank publish a working paper or policy brief series? ("Other publications")*

This indicator aims to include in the ranking all the publications that cannot be evaluated through bibliometrics. For a think tank, publishing autonomously its material in working paper or policy briefs is a clear sign of the will to disseminate its research and its ideas. By publishing such documents, think tanks have a great resource to reach even a wider public than they would through peer-reviewed publications. This public is even wider if the publications are made available for free over the internet.

**Data transparency:** this information can be confirmed easily, as it is clearly presented on every think tank's website.

[34] Tierry Marchant, *Score-based bibliometric rankings of authors*, 2009. This article outlines the theoretical framework to build bibliometric indicators.

# 7. Building the ranking

## a. Normalization

This section will present the steps needed to compile the ranking on the basis of the indicators indicated in detail above.

All the indicators have been divided over the number of researchers who have worked in the think tank, in the climate-change related area, in the reference year (2012).

In order to aggregate the indicators in a single number, they need to be previously normalized, in such a way that every indicator will obtain a value $I(x)$, where $0 \leq I(x) \leq 1$ with x the value of the Think-Tank on each criteria.

Different methods could be used for normalization; one often used is the *max-min* method:

$$I(x) = \frac{x - \min(X)}{\max(X) - \min(X)}$$

However this approach is not immune to the scale of X, strongly depending on the sampled data distribution. Thus it can happen that even if the sampled values are very close together (very narrow distribution), the data are *stretched*, artificially forced to vary in between zero and one.

A more suitable normalization is the following *max-normalization* that fixes the minimum of the sampled data to zero:

$$I(x) = \frac{x}{\max(X)}$$

This method does not suffer for the min-max drawback, since the original data spread is respected: the higher/lower the difference between two values in *X,* the higher/lower the difference in their normalized value.

However both of the methods, like all the ones based on data solely, suffer of the so called *rank reversal* problem: the ranking position of two alternatives could reverse when a new alternative enters, or an existing one exits from the alternatives set.

Even if this phenomenon is not observed frequently, it renders suspicious the procedure. The reason of rank reversal relays on the *data dependent*

normalization, and characterizes all the approaches based on similar normalization techniques, even if some of them are more or less sensitive to outliers – the max-normalization is less sensitive than the max-min normalization. A formally way to avoid this problem consists into the elicitation of a Value Function for each indicator, a function which transform the original data in a common scale in such a way to let all the indicators comparable each other; given that the Value Function is not dependent on the data but a priori defined, the rank reversal cannot appear. Nevertheless, the elicitation of a suitable Value Function is not an easy task, and can be too much subjective and/or normative. Again, the *max*-normalization can be intended as a *measure* of how much a target is reached, meaning that if a high value – suppose – is reached in the data set (the target), it means that at least this level could be reached by other Think Tanks. This method can be a suitable compromise between formal correctness and practical application, and, for these reasons, it will be adopted in our case. In fact, roughly speaking, it is consistent and similar to the concept of piecewise linear *Value Function* in *Multi Criteria Decision Analysis*; it is consistent in that as the sample number of Think-Tank participating in the price increases, the maximum in each criteria converges to the true value of *excellence* allowing us to obtain sufficiently robust results.

### b. Aggregation method and weighting scheme

After the values of the indicators were normalized, they have been aggregated into a single final score.

Weights, representing the relative importance of that criteria respect the others belonging to the same node, will be assigned. A *weighted average method* then was used. A further option, that considers the relative importance of indicators in a single branch and the relations of substitutability and complementarity, has being explored, and could be used as the standard method in the future.

The weights are being collected through a survey to a panel of experts, including distinguished scholars working in the field of climate change economics and policy selected from the networks of FEEM and EAERE (European Association of Environmental and Resource Economists), as well as think tank members and individual researchers working in close contact with think tanks and policy makers. The survey has then been disseminated using the Qualtrics platform.

*The method*

Given that each of the *K* Experts may have different preferences about indicators, they could express different weights at each sub-node of the Decision Tree, assigning more or less (relative) importance to any of the indicators referring to each node or sub-node. In the spirit that more consensual judgments are more reliable that the one of a *Sebastian*, an Expert valuations have to be weighted more if similar to the majority of the other ones, and less conversely.

To this purpose, let $v_i^k(j)$ be the valuation (i.e. the weight) of *k-th* Expert for the *i-th* (sub-)node of cardinality $N_i$, that is $j=1,...N_i,\ k=1,..,K$. At first, the algorithm computes the (Manhattan) distance of every Expert's valuations to all other Experts' valuations at a given node. If the distance is high, his valuation will differ a lot from those of other Experts; consequently he will receive a low weight. On the contrary, when the Expert's valuation is in agreement with those of the majority, his valuation will be weighted more.

Let $D_i^k$ be the total (absolute) distance of *k-th* Expert's judgements to all other ones:

$$D_i^k = \sum_{\substack{l=1 \\ l\neq k}}^{K} \sum_{j=1}^{N_i} \left| v_{i,j}^k - v_{i,j}^l \right|$$

Again, let $TotD_i$ be the sum of absolute distances of all DMs:

$$TotD_i = \sum_{k=1}^{K} D_i^k$$

It is natural to weight more an Expert if he is consensual with the group, i.e. his (absolute) importance weight will be inversely proportional to $D_i^k$:

$$W_i^k = \left( \frac{D_i^k}{TotD_i} \right)^{-1}$$

After normalization, the Expert's (relative) evaluation if finally obtained (bounded between 0-1, and summing up to one):

$$w_i^k = \frac{W_i^i}{\sum_{k=1}^{K} W_i^k}$$

Using these normalized weights, each Expert's valuations at a given sub-node, is aggregated by a weighted average, being $Nnode$ the total number of node (and sub-node) in the Tree

$$v_i(j) = \sum_{k=1}^{K} w_i^k v_i^k(j), \;\; j = 1,..,N_i; \;\; i = Nnode$$

The same procedure can be applied to both the Trees considered, Global and EU.

*Results*

A group of international experts (16 belonging to the European area and 15 based outside Europe) were interviewed in order to assign the weights to be associated to each node of the decision tree. The Manhattan distance approach was used to compute the final weights: for those nodes with the same type and number of criteria in the Global and European ranking, the opinions of all the experts were jointly considered; for the remaining criteria, instead, the weights are the result of the specific experts' geographic area.

The table below shows the results of our survey - Manhattan distance, sample mean and standard deviation for each criteria are computed:

| Criteria | EU Ranking | | | Global Ranking | | |
|---|---|---|---|---|---|---|
| | *MD* | *Mean* | *Stand. Dev* | *MD* | *Mean* | *Stand. Dev* |
| *Activities* | 51.13 | 50.87 | 11.29 | 51.13 | 50.87 | 11.29 |
| *Publications* | 48.87 | 49.13 | 11.29 | 48.87 | 49.13 | 11.29 |
| *Publications peer reviewed* | 52.97 | 52.19 | 18.51 | 52.97 | 52.19 | 18.51 |
| *Other Publications* | 47.03 | 47.81 | 18.51 | 47.03 | 47.81 | 18.51 |
| *Events* | 38.76 | 40.94 | 18.61 | 46.72 | 48.27 | 13.76 |
| *EU Projects* | 27.29 | 26.56 | 12.92 | - | - | - |
| *Int. Clim. Pol. Involvement* | 33.95 | 32.50 | 11.29 | 53.28 | 51.73 | 13.76 |
| *Global Involvement* | 59.10 | 59.18 | 17.93 | - | - | - |
| *EU consultation* | 40.90 | 40.82 | 17.93 | - | - | - |
| *IPCC reports* | 60.36 | 61.29 | 23.43 | 60.36 | 61.29 | 23.43 |
| *UNFCC submissions* | 39.64 | 38.71 | 23.43 | 39.64 | 38.71 | 23.43 |

## 8. The 2012 ICCG Climate Think Tank Ranking

As previously explained in section 4, a further distinction that has been taken into account in the analysis is between the per capita productivity and the overall productivity of think tanks that specialize in climate change economics and policy, which led to two different rankings. In the first case two *Standardized Rankings* were built, one for the European and the other for the Global category, where all the activity outputs of a think tank in 2012 have been standardized by the number of its researchers. In the second case, two *Absolute Rankings* were built where all the activity outputs produced by the think tank in 2012 were considered in absolute terms in both the European category and in the Global one.

Since we consider per capita productivity as the best effective criteria to assess think tanks, only the *Standardized Ranking* has determined the 2012 ICCG Climate Think Tank Ranking winners in the European and the Global categories. Nevertheless, for further detailed information, the following charts show the results of the *Absolute Rankings*.

The winner of the 2012 ICCG Climate Think Tank Ranking according to the standardized ranking in the European category is the *Basque Centre for Climate Change (BC3)*, founded in 2008 in Bilbao, Spain. The winner for the Global category is the *Belfer Center for Science and international Affairs,* founded in 1973 in Cambridge, MA, USA.

It is worth explaining that in the case of the *Belfer Center for Science and international Affairs,* as it has been the case with many other multidisciplinary think tanks, only the relevant data, i.e. those concerning the Environment and Natural Resources Program, have been taken into consideration.[35]

In the following tables, the European and Global rankings in the standardized and absolute versions are shown. The European category is composed of 34 think tanks, whereas the Global category is composed of 27 additional think tanks, for a total of 61 think tanks assessed in this first climate think tank ranking.

[35] See section 2 for a definition of Climate Change Economics and Policy.

# Standardized European Ranking

| | Think_Tank | Score |
|---|---|---|
| 1 | **BC3 Basque Centre for Climate Change** | 0,5918 |
| 2 | International Institute for Applied Systems Analysis | 0,5730 |
| 3 | Centre for European Policy Studies (CEPS) | 0,5375 |
| 4 | Cambridge Centre for Climate Change Mitigation Research (4CMR) | 0,4970 |
| 5 | Potsdam Institute for Climate Impact Research (PIK) | 0,4852 |
| 6 | ZEW- Environmental and Resource Economics, Environmental Management Unit | 0,4547 |
| 7 | CDC Climat | 0,4477 |
| 8 | FEEM | 0,4421 |
| 9 | International Human Dimensions Programme on Global Environmental Change (UNU-IHDP) | 0,4387 |
| 10 | Climate and Development Knowledge Network | 0,4280 |
| 11 | The Beijer Institute of Ecological Economics | 0,4174 |
| 12 | Chatham House | 0,4109 |
| 13 | Institute for Sustainable Development and International Relations (IDDRI) | 0,3913 |
| 14 | Wuppertal Institute for Climate, Environment and Energy | 0,3906 |
| 15 | IEFE | 0,3829 |
| 16 | Stockholm Environment Institute (SEI) | 0,3601 |
| 17 | Kiel Institute for the World Economy | 0,3525 |
| 18 | CCIAM - Climate Change Impacts, Adaptation and Modelling | 0,3399 |
| 19 | Centro Euro-Mediterraneo sui Cambiamenti Climatici - CMCC | 0,3330 |
| 20 | Energy Research Centre of the Netherlands | 0,3157 |
| 21 | Ecologic Institute | 0,3060 |
| 22 | Climate Strategies | 0,3008 |
| 23 | Sustainable Europe Research Institute (SERI) | 0,2893 |
| 24 | Tyndall Centre for Climate Change Research | 0,2884 |
| 25 | Environmental Hydraulics Institute IH Cantabria | 0,2767 |
| 26 | International Institute for Environment and Development (IIED) | 0,2724 |
| 27 | Centre International de Recherche sur l'Environnement et le Developpement (CIRED) | 0,2642 |
| 28 | Copenhagen Consensus Center (CCC) | 0,2462 |
| 29 | E3G Third Generation Environmentalism | 0,0897 |
| 30 | Mercator Research Institute on Global Commons and Climate Change (MCC) | 0,0686 |
| 31 | European Climate Foundation (ECF) | 0,0479 |
| 32 | Global Climate Adaptation Partnership | 0,0249 |
| 33 | Oeko Institut | 0,0163 |
| 34 | CliMates | 0,0066 |

# Absolute European Ranking

| | Think_Tank | Score |
|---|---|---|
| 1 | Potsdam Institute for Climate Impact Research (PIK) | 0,7982 |
| 2 | International Institute for Applied Systems Analysis | 0,7945 |
| 3 | Wuppertal Institute for Climate, Environment and Energy | 0,5478 |
| 4 | FEEM | 0,5006 |
| 5 | Stockholm Environment Institute (SEI) | 0,4606 |
| 6 | Energy Research Centre of the Netherlands | 0,4273 |
| 7 | Centro Euro-Mediterraneo sui Cambiamenti Climatici - CMCC | 0,4167 |
| 8 | Ecologic Institute | 0,3791 |
| 9 | Centre for European Policy Studies (CEPS) | 0,3771 |
| 10 | CDC Climat | 0,3533 |
| 11 | Tyndall Centre for Climate Change Research | 0,3364 |
| 12 | Chatham House | 0,3353 |
| 13 | BC3 Basque Centre for Climate Change | 0,3295 |
| 14 | Kiel Institute for the World Economy | 0,3233 |
| 15 | ZEW- Environmental and Resource Economics, Environmental Management Unit | 0,3208 |
| 16 | The Beijer Institute of Ecological Economics | 0,2965 |
| 17 | IEFE | 0,2851 |
| 18 | Climate Strategies | 0,2846 |
| 19 | Cambridge Centre for Climate Change Mitigation Research (4CMR) | 0,2832 |
| 20 | Centre International de Recherche sur l'Environnement et le Developpement (CIRED) | 0,2806 |
| 21 | Institute for Sustainable Development and International Relations (IDDRI) | 0,2800 |
| 22 | CCIAM - Climate Change Impacts, Adaptation and Modelling | 0,2743 |
| 23 | Sustainable Europe Research Institute (SERI) | 0,2717 |
| 24 | International Institute for Environment and Development (IIED) | 0,2686 |
| 25 | Environmental Hydraulics Institute IH Cantabria | 0,2663 |
| 26 | Climate and Development Knowledge Network | 0,2629 |
| 27 | International Human Dimensions Programme on Global Environmental Change (UNU-IHDP) | 0,2585 |
| 28 | Copenhagen Consensus Center (CCC) | 0,2318 |
| 29 | E3G Third Generation Environmentalism | 0,0794 |
| 30 | European Climate Foundation (ECF) | 0,0525 |
| 31 | Oeko Institut | 0,0389 |
| 32 | Mercator Research Institute on Global Commons and Climate Change (MCC) | 0,0203 |
| 33 | CliMates | 0,0136 |
| 34 | Global Climate Adaptation Partnership | 0,0113 |

# Standardized Global Ranking

| | Think_Tank | Score |
|---|---|---|
| 1 | **Belfer Center for Science and International Affairs** | 0,6686 |
| 2 | Princeton Environmental Institute (PEI) | 0,5890 |
| 3 | Woods Hole Research Center (WHRC) | 0,5254 |
| 4 | MIT Center for Energy and Environmental Policy Research (CEEPR) | 0,5232 |
| 5 | RAND Corporation | 0,4976 |
| 6 | Worldwatch Institute | 0,4687 |
| 7 | Resources for the Future (RFF) | 0,4542 |
| 8 | Climate Action Network-International (CAN) | 0,4125 |
| 9 | Nicholas institute for Environmental Policy Solutions | 0,4012 |
| 10 | Purdue Climate Change Research Center (PCCRC) | 0,3958 |
| 11 | Motu Economic and Public Policy Research | 0,3946 |
| 12 | Amazon Environmental Research Institute | 0,3883 |
| 13 | Brookings Institution | 0,3829 |
| 14 | Climate Policy Initiative (CPI) | 0,3650 |
| 15 | Council on Energy, Environment and Water (CEEW) | 0,3612 |
| 16 | Center for International Environmental Studies (CIES) | 0,3559 |
| 17 | Center for Climate and Energy Solutions (C2ES) | 0,3493 |
| 18 | Peterson Institute for International Economics | 0,3373 |
| 19 | World Resources Institute | 0,2969 |
| 20 | Conservation International | 0,2776 |
| 21 | Fung Global Institute | 0,2753 |
| 22 | Centre for Environment & Development for the Arab Region and Europe (CEDARE) | 0,2657 |
| 23 | International Centre for Climate Change and Development | 0,2609 |
| 24 | The Energy and Resources Institute (TERI) | 0,2601 |
| 25 | Environmental Defense Fund (EDF) | 0,2517 |
| 26 | Fridtjof Nansen Institute (FNI) | 0,2463 |
| 27 | Global Adaptation Institute | 0,1777 |

# Absolute Global Ranking

| | Think_Tank | Score |
|---|---|---|
| 1 | The Energy and Resources Institute (TERI) | 0,6710 |
| 2 | Belfer Center for Science and International Affairs | 0,6360 |
| 3 | Woods Hole Research Center (WHRC) | 0,5188 |
| 4 | Resources for the Future (RFF) | 0,4803 |
| 5 | Princeton Environmental Institute (PEI) | 0,4537 |
| 6 | MIT Center for Energy and Environmental Policy Research (CEEPR) | 0,4311 |
| 7 | Purdue Climate Change Research Center (PCCRC) | 0,4204 |
| 8 | RAND Corporation | 0,4145 |
| 9 | Amazon Environmental Research Institute | 0,4059 |
| 10 | World Resources Institute | 0,3914 |
| 11 | Environmental Defense Fund (EDF) | 0,3572 |
| 12 | Climate Action Network-International (CAN) | 0,3511 |
| 13 | Worldwatch Institute | 0,3413 |
| 14 | Peterson Institute for International Economics | 0,3375 |
| 15 | Brookings Institution | 0,3154 |
| 16 | Climate Policy Initiative (CPI) | 0,3141 |
| 17 | Conservation International | 0,3059 |
| 18 | Nicholas institute for Environmental Policy Solutions | 0,3031 |
| 19 | Center for International Environmental Studies (CIES) | 0,2803 |
| 20 | Motu Economic and Public Policy Research | 0,2701 |
| 21 | Council on Energy, Environment and Water (CEEW) | 0,2590 |
| 22 | Centre for Environment & Development for the Arab Region and Europe (CEDARE) | 0,2537 |
| 23 | Center for Climate and Energy Solutions (C2ES) | 0,2511 |
| 24 | Fung Global Institute | 0,2511 |
| 25 | International Centre for Climate Change and Development | 0,2441 |
| 26 | Fridtjof Nansen Institute (FNI) | 0,2404 |
| 27 | Global Adaptation Institute | 0,0464 |

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## The Think Tank Map

The Think Tank Map, a project developed by the International Center for Climate Governance (ICCG), was launched in 2011 as an instrument to provide a complete overview of active think tanks in the field of climate change economics and policy. The Think Tank Map is at present composed of 275 think tanks worldwide.

The Think Tank Map is not only a showcase for every organization working on Climate change economics and policy, but it is also a catalyst for new cooperation opportunities, allowing stakeholders, researchers, institutions, and the media to be informed on all the relevant activities, to find new contacts, and to engage in mutually beneficial partnerships.

By collecting both scientific and statistic data about many different entities, the Think Tank Map observatory is the starting point for a series of in-depth studies about the think tanks working in the field of climate change and their influence on policy makers.

**About ICCG**

The International Center for Climate Governance (ICCG) was founded in 2009 as a joint initiative of Fondazione Eni Enrico Mattei (FEEM) and Fondazione Giorgio Cini. The ICCG is chaired by Professor Carlo Carraro. ICCG is now an internationally renowned center whose research activities focus on climate change economics and policy. Located on the Island of San Giorgio Maggiore in Venice, ICCG gathers researchers in economics and political sciences who explore the interdependencies between the economic, social, cultural, ethical, and political aspects of climate economics and policy.

In particular, ICCG activities focus on:

IMPACTS - Climate change long-term impacts on socio-economic systems and their institutions

CHANGES - Sectoral and geographical distribution of these impacts and structural changes

POLICY - International climate policy and the definition of governance models to control climate change.

Besides research, ICCG activities involve the organization of international events, such as conferences, policy meetings, and lectures.