KPMG Dynamic Risk Assessment helps the City of Sydney develop its climate change strategy

The City of Sydney in New South Wales, Australia needed to understand how climate change is likely to affect the city in 2030 in order to develop an effective Climate Adaptation Plan. KPMG in Australia performed a DRA to understand the interdependencies between 32 different climate change risks faced by the city. KPMG analysts used expert elicitation to develop a graphic representation of the relationships between the risks and perceptions of severity. Their analysis also identified trigger risks which were central to causing other risks, and those that are most centrally affected by other risks. Clusters of risks that were likely to occur together were also identified, so that these could be managed together.

As a result of the DRA, the Sydney City Council benefited from greatly improved insight into the risks that climate change posed to the city and was in a better position to develop actions to address these.

Click here to learn more about the KPMG Dynamic Risk Assessment service.
More sophisticated risk assessment means more effective risk management

Organizations today – both public and private – face a multitude of environmental, social and governance (ESG) risks.

From a booming population to shifting social norms, changing weather patterns to declining ecosystems, the risk landscape grows more complex and interconnected every year.

For decades, organizations have used a two-dimensional approach to predict risk, grading individual risks according to their likelihood and severity. But this method is increasingly incapable of foreseeing and preventing crises that arise from complex chain reactions and tipping points.

KPMG Dynamic Risk Assessment (DRA), by contrast, investigates the structure of the whole risk system to understand the connections between risks and the speed at which risk impacts could occur.

As a result, DRA provides a three-dimensional and dynamic view of risk. It helps organizations make better-informed decisions by understanding what can happen when individual risks combine and interact. It also helps to identify the most effective intervention points to reduce the likelihood and severity of risk clusters and turn challenges into opportunities.

How Dynamic Risk Assessment works

The foundation of DRA is ‘expert elicitation’: a synthesis of expert opinions. DRA uses human beings as a core tool for risk forecasting because, unlike historical data, human beings are capable of looking forwards as well as backwards.

Science tells us that a diverse group of experts, is the most reliable forecasting tool in an unpredictable world. The World Economic Forum, for example, uses a similar technique to produce its annual Global Risks Report.1

The KPMG Dynamic Risk Assessment process therefore begins with collecting opinions from experts both within the organization and, where appropriate, from outside.

In the sustainability context, it can be helpful to involve external experts on environmental and social trends if subject matter expertise within the organization is limited.

Using expert elicitation, DRA taps into the ‘sensing capacity’ of the experts to draw up a risk list, assess the likelihood, potential impacts and velocity of the risks, and to map the connections and relationships between them.

Three-dimensional and dynamic view of a risk system

As shown in the diagram below, certain risks are more strongly connected to other risks, forming a cluster. The red circle represents the risks that are most likely to influence or affect other risks, and/or be impacted by other risks.

KPMG Dynamic Risk Assessment follows a three-step process

1. Undertake expert elicitation
   - Identify participants based on the science of expert elicitation
   - Run interviews, workshops and use the KPMG proprietary survey tool to tap into the sensing capacity of the experts

2. Apply network theory
   - Run KPMG proprietary mathematical calculations on the input from experts
   - Use academic peer-reviewed network analysis from external researchers

3. Map and analyze risks
   - Map the organization's dynamic risk system
   - Analyze the risk system to identify trigger risks, risk clusters, critical vulnerabilities and opportunities
   - Based on the organization’s identified vulnerabilities and opportunities, feed this into its management decision making or strategy

Contact us to find out how KPMG member firms can help you.
More sophisticated risk assessment means more effective risk management

Organizations today – both public and private – face a multitude of environmental, social, and governance (ESG) risks. From a booming population to shifting social norms, changing weather patterns to declining ecosystems, the risk landscape grows more complex and interconnected every year. For decades, organizations have used a two-dimensional approach to predict risk, grading individual risks according to their likelihood and severity. But this method is increasingly incapable of foreseeing and preventing crises that arise from complex chain reactions and tipping points.

KPMG Dynamic Risk Assessment (DRA), by contrast, investigates the structure of the whole risk system to understand the connections between risks and the speed at which risk impacts could occur. As a result, DRA provides a three-dimensional and dynamic view of risk. It helps organizations make better-informed decisions by understanding what can happen when individual risks combine and interact. It also helps to identify the most effective intervention points to reduce the likelihood and severity of risk clusters and turn challenges into opportunities.

How Dynamic Risk Assessment works

The foundation of DRA is ‘expert elicitation’: a synthesis of expert opinions. DRA uses human beings as a core tool for risk forecasting because, unlike historical data, human beings are capable of looking forwards as well as backwards. Science tells us that a diverse group of experts is the most reliable forecasting tool in an unpredictable world. The World Economic Forum, for example, uses a similar technique to produce its annual Global Risks Report 1.

The KPMG Dynamic Risk Assessment process therefore begins with collecting opinions from experts both within the organization and, where appropriate, from outside. In the sustainability context, it can be helpful to involve external experts on environmental and social trends if subject matter expertise within the organization is limited.

Using expert elicitation, DRA taps into the ‘sensing capacity’ of the experts to draw up a risk list, assess the likelihood, potential impacts and velocity of the risks, and to map the connections and relationships between them.

Three-dimensional and dynamic view of a risk system

As shown in the diagram below, certain risks are more strongly connected to other risks, forming a cluster. The red circle represents the risks that are most likely to influence or affect other risks, and/or be impacted by other risks.

Traditional, two-dimensional and static view of risk

Contact us to find out how KPMG member firms can help you.

Anette Rønnov  
Head of KPMG Sustainability services, KPMG Norway  
Directo, KPMG in Norway  
anette.ronnov@kpmg.no

Andries Terblanche  
Global Leader, KPMG Dynamic Risk Assessment, KPMG International  
Partner, KPMG in the UK  
andries.terblanche@kpmg.co.uk

KPMG Dynamic Risk Assessment follows a three-step process

1. Undertake expert elicitation
   - Identify participants based on the science of expert elicitation
   - Run interviews, workshops and use the KPMG proprietary survey tool to tap into the sensing capacity of the experts

2. Apply network theory
   - Map the organization’s dynamic risk system
   - Analyse the risk system to identify trigger risks, risk clusters, critical vulnerabilities and opportunities
   - Based on the organization’s identified vulnerabilities and opportunities, feed this into its management decision-making or strategy

3. Map and analyze risks
   - Use academic peer-reviewed network analysis from external researchers

More sophisticated risk assessment means more effective risk management

Organizations today – both public and private – face a multitude of environmental, social and governance (ESG) risks.

From a booming population to shifting social norms, changing weather patterns to declining ecosystems, the risk landscape grows more complex and interconnected every year.

For decades, organizations have used a two-dimensional approach to predict risk, grading individual risks according to their likelihood and severity. But this method is increasingly incapable of foreseeing and preventing crises that arise from complex chain reactions and tipping points.

KPMG Dynamic Risk Assessment (DRA), by contrast, investigates the structure of the whole risk system to understand the connections between risks and the speed at which risk impacts could occur.

As a result, DRA provides a three-dimensional and dynamic view of risk. It helps organizations make better-informed decisions by understanding what can happen when individual risks combine and interact. It also helps to identify the most effective intervention points to reduce the likelihood and severity of risk clusters and turn challenges into opportunities.

KPMG Dynamic Risk Assessment follows a three-step process

1. Undertake expert elicitation
   - Identify participants based on the science of expert elicitation
   - Run interviews, workshops and use the KPMG proprietary survey tool to tap into the sensing capacity of the experts
   - Run KPMG proprietary mathematical calculations on the input from experts
   - Use academic peer-reviewed network analysis from external researchers

2. Map and analyze risks
   - Map the organization’s dynamic risk system
   - Analyze the risk system to identify trigger risks, risk clusters, critical vulnerabilities and opportunities
   - Based on the organization’s identified vulnerabilities and opportunities, feed this into its management decision-making or strategy

3. Apply network theory
   - Undertake expert elicitation
   - Map and analyze risks
   - Apply network theory

Contact us to find out how KPMG member firms can help you.

Anette Rønnov
Head of KPMG Sustainability services, KPMG Norway
Director, KPMG in Norway
anette.ronnev@kpmg.no

Andries Terblanche
Global Leader, KPMG Dynamic Risk Assessment, KPMG International
Partner, KPMG in the UK
andries.terblanche@kpmg.co.uk

How Dynamic Risk Assessment works

The foundation of DRA is ‘expert elicitation’: a synthesis of expert opinions. DRA uses human beings as a core tool for risk forecasting because, unlike historical data, human beings are capable of looking forwards as well as backwards.

Science tells us that a diverse group of experts, is the most reliable forecasting tool in an unpredictable world. The World Economic Forum, for example, uses a similar technique to produce its annual Global Risks Report.1

The KPMG Dynamic Risk Assessment process therefore begins with collecting opinions from experts both within the organization and, where appropriate, from outside. In the sustainability context, it can be helpful to involve external experts on environmental and social trends if subject matter expertise within the organization is limited.

Using expert elicitation, DRA taps into the ‘sensing capacity’ of the experts to draw up a risk list, assess the likelihood, potential impacts and velocity of the risks, and to map the connections and relationships between them.

Three-dimensional and dynamic view of a risk system

As shown in the diagram below, certain risks are more strongly connected to other risks, forming a cluster. The red circle represents the risks that are most likely to influence or affect other risks, and/or be impacted by other risks.

KPMG Dynamic Risk Assessment is scalable and can be used to understand a broad range of risks, or to perform a deep-dive assessment of how a single risk such as climate change or water scarcity is likely to affect an organization.

Organizations today – both public and private – face a multitude of environmental, social and governance (ESG) risks.

From a booming population to shifting social norms, changing weather patterns to declining ecosystems, the risk landscape grows more complex and interconnected every year.

For decades, organizations have used a two-dimensional approach to predict risk, grading individual risks according to their likelihood and severity. But this method is increasingly incapable of foreseeing and preventing crises that arise from complex chain reactions and tipping points.

KPMG Dynamic Risk Assessment (DRA), by contrast, investigates the structure of the whole risk system to understand the connections between risks and the speed at which risk impacts could occur.

As a result, DRA provides a three-dimensional and dynamic view of risk. It helps organizations make better-informed decisions by understanding what can happen when individual risks combine and interact. It also helps to identify the most effective intervention points to reduce the likelihood and severity of risk clusters and turn challenges into opportunities.

KPMG Dynamic Risk Assessment follows a three-step process

1. Undertake expert elicitation
   - Identify participants based on the science of expert elicitation
   - Run interviews, workshops and use the KPMG proprietary survey tool to tap into the sensing capacity of the experts
   - Run KPMG proprietary mathematical calculations on the input from experts
   - Use academic peer-reviewed network analysis from external researchers

2. Map and analyze risks
   - Map the organization’s dynamic risk system
   - Analyze the risk system to identify trigger risks, risk clusters, critical vulnerabilities and opportunities
   - Based on the organization’s identified vulnerabilities and opportunities, feed this into its management decision-making or strategy

1https://www.weforum.org/reports/the-global-risks-report-2018
KPMG Dynamic Risk Assessment helps the City of Sydney develop its climate change strategy

The City of Sydney in New South Wales, Australia needed to understand how climate change is likely to affect the city in 2030 in order to develop an effective Climate Adaptation Plan. KPMG in Australia performed a DRA to understand the interdependencies between 32 different climate change risks faced by the city. KPMG analysts used expert elicitation to develop a graphic representation of the relationships between the risks and perceptions of severity. Their analysis also identified trigger risks which were central to causing other risks, and those that are most centrally affected by other risks. Clusters of risks that were likely to occur together were also identified, so that these could be managed together.

As a result of the DRA, the Sydney City Council benefited from greatly improved insight into the risks that climate change poses to the city and was in a better position to develop actions to address these.

The thickness of the connecting lines in the diagram illustrates the strength of the connections between the individual risks.

KPMG Dynamic Risk Assessment helps the City of Sydney develop its climate change strategy.

The City of Sydney in New South Wales, Australia needed to understand how climate change is likely to affect the city in 2030 in order to develop an effective Climate Adaptation Plan. KPMG in Australia performed a DRA to understand the interdependencies between 32 different climate change risks faced by the city. KPMG analysts used expert elicitation to develop a graphic representation of the relationships between the risks and perceptions of severity. Their analysis also identified trigger risks which were central to causing other risks, and those that are most centrally affected by other risks. Clusters of risks that were likely to occur together were also identified, so that these could be managed together.

As a result of the DRA, the Sydney City Council benefited from greatly improved insight into the risks that climate change posed to the city and was in a better position to develop actions to address these

**Image**

The thickness of the connecting lines in the diagram illustrates the strength of the connections between the individual risks.

---

**Local KPMG contacts**

- Argentina: Marcelo Varela <intrastructure@kpmg.com.ar>
- Austria: Peter Gatschl <peter.gatschl@kpmg.com>
- Australia: Victor Sage <victor.sage@kpmg.com.au>
- Australia: Mike Brown <mike.brown@kpmg.com.au>
- Brazil: Ronaldo Dias <ronaldo.dias@kpmg.com.br>
- Canada: Bill A. Murphy <bill.murphy@kpmg.ca>
- Chile: Laszlo Fedor-Avila <laszlo.fedor-avila@kpmg.cl>
- China: Mao Zheng <mao.zheng@kpmg.com.cn>
- Colombia: Fabian Behrendt <fabian.behrendt@kpmg.co.uk>
- Czech Republic: Michal Chladek <Michal.chladek@kpmg.cz>
- Costa Rica: HOA <hoa@kpmg.co.cr>
- Croatia: Ivan Pasko <ivan.pasko@kpmg.hr>
- Denmark: Francine Lebacqz <francine.lebacqz@kpmg.dk>
- Egypt: Mohamed El-Sayed <mohamed.el-sayed@kpmg.com.eg>
- Finland: Tuomas Ottosen <tuomas.ottosen@kpmg.fi>
- France: Philippe Armand <philippe.armand@kpmg.fr>
- Georgia: Iakob Gvantsa <iakob.gvantsa@kpmg.com.ge>
- Germany: Christian Hell <christian.hell@kpmg.de>
- Greece: Iacovos Ghalanos <iacovos.ghalanos@kpmg.com.cy>
- Hong Kong: Maurice Lucas <maurice.lucas@kpmg.com.hk>
- India: Alok Goel <alok.goel@kpmg.com.in>
- Indonesia: Ignasius Joni <ignasius.joni@kpmg.co.id>
- Israel: Dan Gush <dan.gush@kpmg.co.il>
- Italy: Fabrizio Barzaghi <fabrizio.barzaghi@kpmg.it>
- Japan: Fusako Ikeda <fusako.ikeda@kpmg.co.jp>
- Jordan: Yasser Fawaz <yasser.fawaz@kpmg.com.jo>
- Kazakhstan: Kadyrzhaltan Suren <kadyrzhaltan.suren@kpmg.com.kz>
- Korea: Jeon Seungju <jeon.seungju@kpmg.com.kr>
- Korea: Kasturi Nathan <kasturi.nathan@kpmg.com.my>
- Korea: Lee Kangyu <lee.kangyu@kpmg.com.kr>
- Korea: Jo Hee-Sook <jose.bae@kpmg.com.kr>
- Korea: Kwang-Hyeon Moon <kwang-hyeon.moon@kpmg.com.kr>
- Kuwait: Rashid Al-Ammari <rashid.ammari@kpmg.com.kw>
- Latvia: Edgars Aurins <edgars.aurins@kpmg.com.lv>
- Lebanon: Mouna El Chaar <mouna.achaar@kpmg.com.lb>
- Malaysia: Ezzuddin Daud <ezzuddin.daud@kpmg.com.my>
- Mexico: Beatriz Velez <beatriz.velez@kpmg.com.mx>
- Netherlands: Pim Boornstra <pim.boornstra@kpmg.nl>
- New Zealand: Luis Felipe Encina <luis.encina@kpmg.com.nz>
- Nigeria: Iyare Komolafe <iylare.komolafe@kpmg.com.ng>
- Norway: Sverre Aasen <sverre.aasen@kpmg.com.no>
- Pakistan: Muhammad Shoaib <muhammad.shoaib@kpmg.com.pk>
- Paraguay: Ezequiel Castro <ezequiel.castro@kpmg.com.py>
- Peru: Martin Ferreira <martin.ferreira@kpmg.com.pe>
- Portugal: Angel Almeida <angel.almeida@kpmg.pt>
- Qatar: Abdulrahman Alkhalif <abdulrahman.khalif@kpmg.com.qa>
- Romania: Cristian Voicu <cristian.voicu@kpmg.ro>
- Russia: Natalia Sosnovskaia <natalia.sosnovskaia@kpmg.ru>
- Saudi Arabia: Naseem Alotaibi <naseem.alotaibi@kpmg.com.sa>
- Serbia: Viktorija Radojevic <viktorija.radojevic@kpmg.rs>
- Singapore: Tan Lian Hang <tan.lianhang@kpmg.com.sg>
- South Africa: Paul Brown <paul.brown@kpmg.co.za>
- South Korea: Hong-Chae Kim <jonghe@kpmg.com>
- Spain: Jose Luis Munoz Varela <jose.luis.munoz@kpmg.com>
- Sri Lanka: W. K. A. S. Gunaratne <w.k.a.s.gunaratne@kpmg.lk>
- Tanzania: Seif Seri <seif.seri@kpmg.co.tz>
- Turkey: Nilüfer Gökay <nilufer.gokay@kpmg.com.tr>
- Ukraine: Ruslan Kondratiuk <ruslan.kondratiuk@kpmg.ua>
- United Arab Emirates: Praveen Choudhary <praveen.choudhary@kpmg.ae>
- United Kingdom: Martin Barsby <martin.barsby@kpmg.co.uk>
- United States: Shiyeng Wu <shiyeng.wu@kpmg.com>
- Uganda: Harriet Nalule <harriet.nalule@kpmg.com.ug>
- Uruguay: Martin Mendivelzua <martin.mendivelzua@kpmg.com.uy>
- Vietnam: Trang Danh Huong <trang.danh@kpmg.com.vn>
- Yemen: Ali Al-Ghoul <ali.ghoul@kpmg.com.ye>
- Zimbabwe:avlingiri@kpmg.co.zw

---

**Understanding social and environmental risk**

How KPMG Dynamic Risk Assessment can help

kpmg.com/sustainability

---

**Image**

Graphic adapted from: RPS (2015)