Executive Summary and Recommendations

Resources Futures

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Executive Summary and Recommendations

The spectre of resource insecurity has come back with a vengeance. The world is undergoing a period of intensified resource stress, driven in part by the scale and speed of demand growth from emerging economies and a decade of tight commodity markets. Poorly designed and short-sighted policies are also making things worse, not better. Whether or not resources are actually running out, the outlook is one of supply disruptions, volatile prices, accelerated environmental degradation and rising political tensions over resource access.

Fears of resource scarcity are not new. On many occasions, higher rates of investment and improved technology have resolved the problem of the day, though often with additional environmental and social costs. With the maturation of technologies to access non-conventional gas and oil, as well as the global economic downturn, some analysts suggest that the resource boom of the past decade is coming to an end – especially in the extractive industries – and that resource-related tensions will ease.

The hard truth is that many of the fundamental conditions that gave rise to the tight markets in the past ten years remain. In the case of food, the world remains only one or two bad harvests away from another global crisis. Lower prices in the meantime may simply trigger another bout of resource binge, especially in the large and growing developing countries.

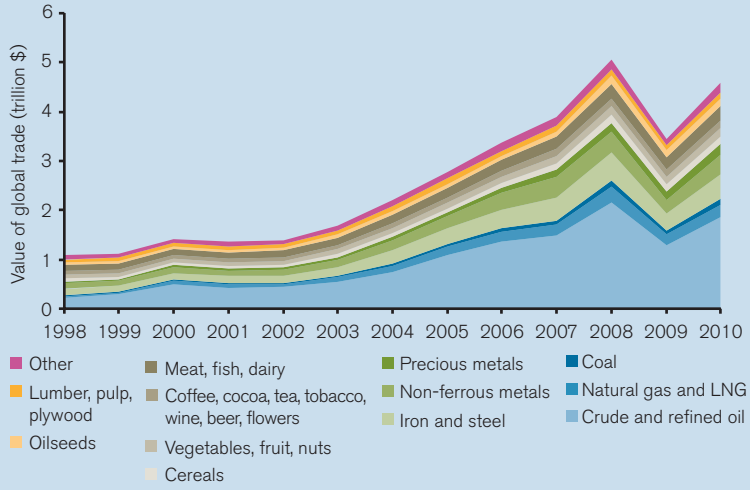
This report focuses on the new political economy of resources. It analyses the latest global trends in the production, trade and consumption of key raw materials or intermediate products and explores how defensive and offensive moves by governments and other stakeholders are creating new fault lines on top of existing weaknesses and uncertainties.

The report also proposes a series of critical interventions, including new informal dialogues involving a group of systemically significant producer and consumer countries ('Resource 30' or R30) to tackle resource price volatility and to improve confidence and coordination in increasingly integrated global resource markets.

The changing global resource landscape

- **Mainstream projections suggest continued demand growth for major resources** – from fossil fuels to food, minerals, fertilizers and timber – until at least 2030, notwithstanding the peril of forecasting. The scope and size of resource consumption, and the associated environmental impacts, risk overwhelming the ability of states, markets and technology to adapt.
- **The emerging economies lie at the epicentre of the new and evolving political economy of critical resources.** The growth of China and India – as both consumers and producers – has affected multiple resource markets. In the past decade, global use of coal, palm oil and iron ore has been growing at 5–10% a year, while that of oil, copper, wheat and rice has been growing at 2% a year.
- **Resource trade has grown nearly 50% from a decade ago in weight terms** owing to expanding trade in oil, iron and steel, coal, oilseeds and cereals – all feedstocks for China, the factory of the world. Beyond the traditional powers and emerging economies, a wave of developing countries will become important resource consumers in the next decade. They are likely to include Iran, Vietnam, Turkey and Thailand.

Figure A: Value of global resource trade (1998–2010)



Source: Chatham House Resource Trade Database, BACI and COMTRADE (2012).

- **Large-scale resource extraction remains concentrated in a handful of countries.** Across 19 resources (crops, timber, fish and meat, metals, fossil fuels and fertilizers) the three largest producers on average account for 56% of global production. The eight dominant players are China, the United States, Australia, the European Union, Brazil, Russia, India and Indonesia. Others with significant production capacities for one or two major resources include Argentina (soybeans), Saudi Arabia (oil), Iran (oil and gas), Canada (potash and nickel) and Chile (copper). For resources with smaller production volumes, such as palm oil or many speciality metals, concentration among producer countries is even higher.

- **A new wave of increasingly important producers has emerged in the wake of the resource boom**, often fuelled by large-scale foreign investment. Peru has become an important producer of copper and zinc, as has Angola for oil. Mongolia (for copper and coal) and Mozambique (for coal and gas) are poised to follow suit. Paraguay has become the fourth largest soybean exporter. Their fast-expanding resource sectors are becoming a flashpoint for social and political tensions.
- **African countries are conspicuous by their absence from lists of major resource producers.** Despite the hype surrounding the so-called 'new scramble for Africa', many agricultural or resource-seeking investments remain speculative or have yet to commence production.
- **The dynamics of resource production and consumption are interlinked through markets, trade and the global environment.** Constraints on the future production of any particular resource lie not only in their availability and price, but also in the accessibility and cost of the other resources used to produce them.
- **Future availability of food, energy, timber and metal resources at affordable costs will be determined by a combination of factors** – including accessible reserves, transportation routes, environmental considerations, technology and input costs (such as water and energy). Reserve figures are often imperfect guides. Also significant will be investment conditions, shaped by the socio-political context in producer and consumer countries. The shale gas phenomenon illustrates the potential for technological innovation and policy incentives to transcend 'resource limits', as well as new risks.
- **Expanding the supply of many resources means a shift in production to more challenging technical and operating environments:** weaker governance, poorer-quality soils, greater climate vulnerability, deeper wells and lower ore grades. Even though the specific consequences will differ among sectors and geographies, the overall shift to more marginal and unconventional production will bring common challenges. These include ecological impacts associated with land-use change; increasing production in climate-sensitive areas; risks of technological failure; more resource-intensive production; and accelerating innovation.

Key findings

1. Volatility is the new normal

Resource price volatility is not just a problem for resource consumers or producers – it has long-term implications for global economic security. This is because volatility increases risk margins, which serve as a powerful deterrent to investment into supply. Short-term but frequent price fluctuations could therefore lead to higher long-term prices and greater supply insecurity.

Local disruptions – whether from extreme weather or labour unrest – can rapidly translate into higher resource prices in international markets. These price spikes in turn create macroeconomic pressures for governments,

especially in consuming states. Political sensitivity to fluctuations could trigger overreactions or even militarized responses that exacerbate these tensions.

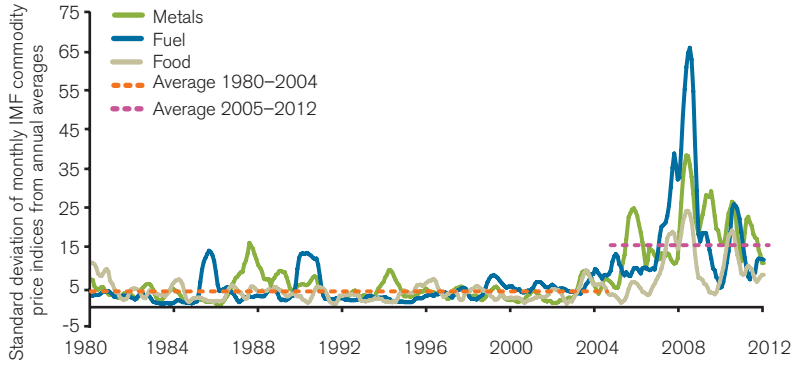
The political and social consequences of a resource price shock are most acute where the transmission mechanism is rapid and resilience is low. In 2011, high prices of staple foods and energy led to a doubling of inflation rates in low-income countries – where these staples make up half of consumer expenditure.[1]

Buffers are smaller than they used to be. The drive for efficiency through just-in-time production models continues to encourage low stockholdings. Global food stocks today remain close to crisis thresholds. The US Department of Agriculture predicted global pre-harvest corn stocks in 2012 falling to the lowest levels since 1974.[2] Mounting environmental stress and continued market interventions by governments reinforce price volatility.

High and fluctuating prices are spurring new waves of resource nationalism and making unilateral and bilateral responses more attractive. For resources such as soybeans, iron ore or palm oil, increased market power in a few producer countries or corporations – whether through mergers and acquisition, nationalization or investments by state-owned enterprises (SOEs) – will limit options for consumers. Competition for critical resources, already acute in many parts of the world, may escalate, with the risk of a downward spiral of increasing competition – between sectors, communities and nation-states – and decreasing trust.

Measures to dampen the threats posed by volatility can serve as an insurance policy for the global economy. Past attempts to manage international resource price volatility through market interventions have, however, been costly and largely unsuccessful. Despite these failures, one key question for the future is whether better use of emergency stocks can be part of the solution. In the medium term, driving down resource intensity and encouraging sustainable use are the only remedies for high and volatile prices.

Figure B: Volatility in commodity markets (1980–2012)



Source: Chatham House calculations based on IMF commodity price data.

1 IMF (2011), *Managing Global Growth Risks and Commodity Price Shocks: Vulnerabilities and Policy Challenges for Low-Income Countries*, International Monetary Fund, available at http://www.imf.org/external/np/pp/eng/2011/092111.pdf.

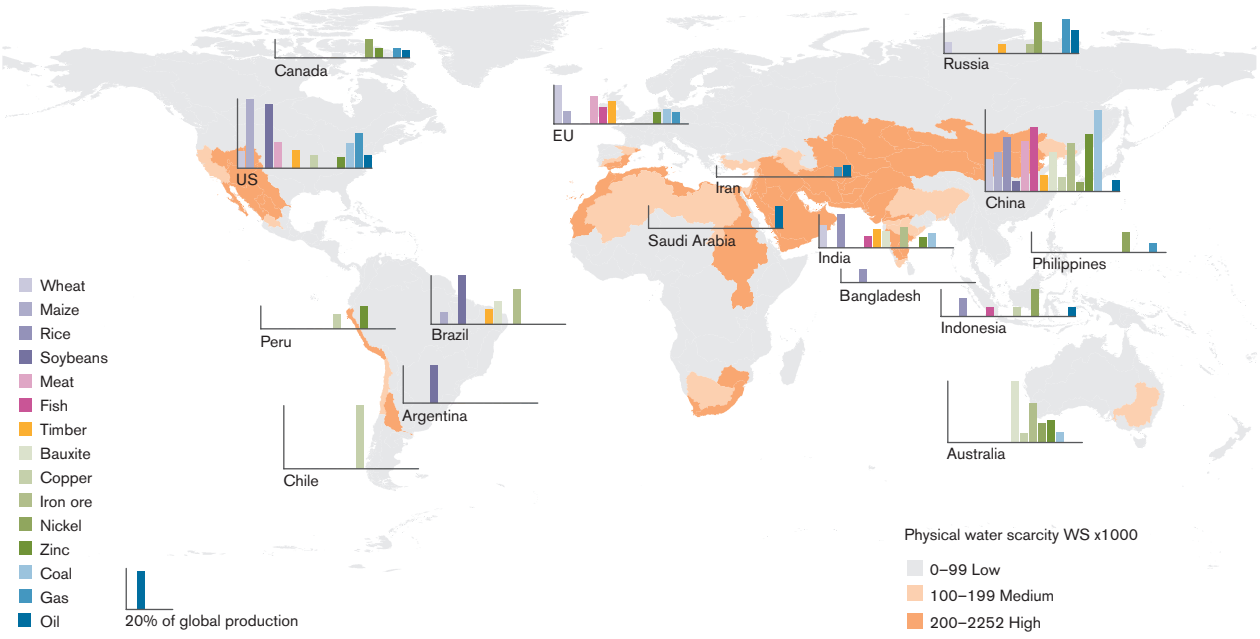
2 Mayer, G. (2012), 'US predicts receding food price threat', *Financial Times*, 23 February 2012, available at http://www.ft.com/cms/s/0/54cf1176-5e40-11e1-85f6-00144feabdc0.html#axzz24wdVnrhu.

2. Environmental change and degradation are challenging traditional approaches

Environmental change and degradation are challenging business-as-usual approaches to resource extraction, production, processing and consumption, whether through scarcities of specific inputs such as water or indirectly through social-political opposition. Climate change is leading to shifts in long-run trends in, for example, temperatures and rainfall patterns. Most ominously, climate change is expected to increase the frequency and severity of extreme events such as heat waves and floods, with the potential to disrupt resource production and further destabilize tight international markets.

Freshwater scarcity stands out as one of the most pressing cross-cutting challenges. While global water withdrawals have tripled in the last 50 years, the reliable supply of water has stayed relatively constant during the same period.[3] There is, moreover, great geographical variation, with sufficiency depending on local conditions, quality and delivery mechanisms. The supply gap is already severe in many developing countries which are least capable of putting in place the necessary policies and infrastructure to capture, produce, treat and distribute water, as well as demand management policies and cross-boundary sharing agreements.

Figure C: Share of global production (>5%) of key commodities and water scarcity



Source: Chatham House analysis based on FAO, EIA, IFA and USGS data.

3. Trade as a frontline for resource conflicts

Trade is becoming a frontline for conflicts over resources – at a time when the global economy is more dependent than ever on trade in resources. Export controls intended to prevent sharp domestic food price

3 World Water Assessment Programme (2009), *The United Nations World Water Development Report 3: Water in a Changing World* (Paris: UNESCO and London: Earthscan).

inflation in many producer countries, for example, ended up magnifying price spikes in 2008 and 2011. A number of key raw materials suppliers (especially manufacturers), such as China and Indonesia, have resorted to export controls as part of a broader move towards more explicit and interventionist industrial policy. Brazil and India are also considering similar measures. However, even short-term export restrictions may backfire if they precipitate similar actions in other producing countries, driving up prices and creating a collapse in confidence that spreads from one resource to another.

With multilateral trade negotiations on hold, escalating trade wars over resources could overwhelm the dispute settlement regime at the World Trade Organization (WTO). There is an urgent need to develop confidence-building measures that will increase transparency and predictability on the use of export controls and other restrictions, especially in the midst of a commodity price crisis. It will also be critical to make a better distinction between environmentally sound and perverse subsidies for resources.

4. Resource politics matter

Resource politics, not environmental preservation or sound economics, are set to dominate the global agenda and are already playing themselves out through trade disputes, climate negotiations, market manipulation strategies, aggressive industrial policies and the scramble to control frontier areas. The quest for resources will put ecologically sensitive areas under continuous pressure unless a cooperative approach is taken, not least in the polar regions, major forests and international fisheries.

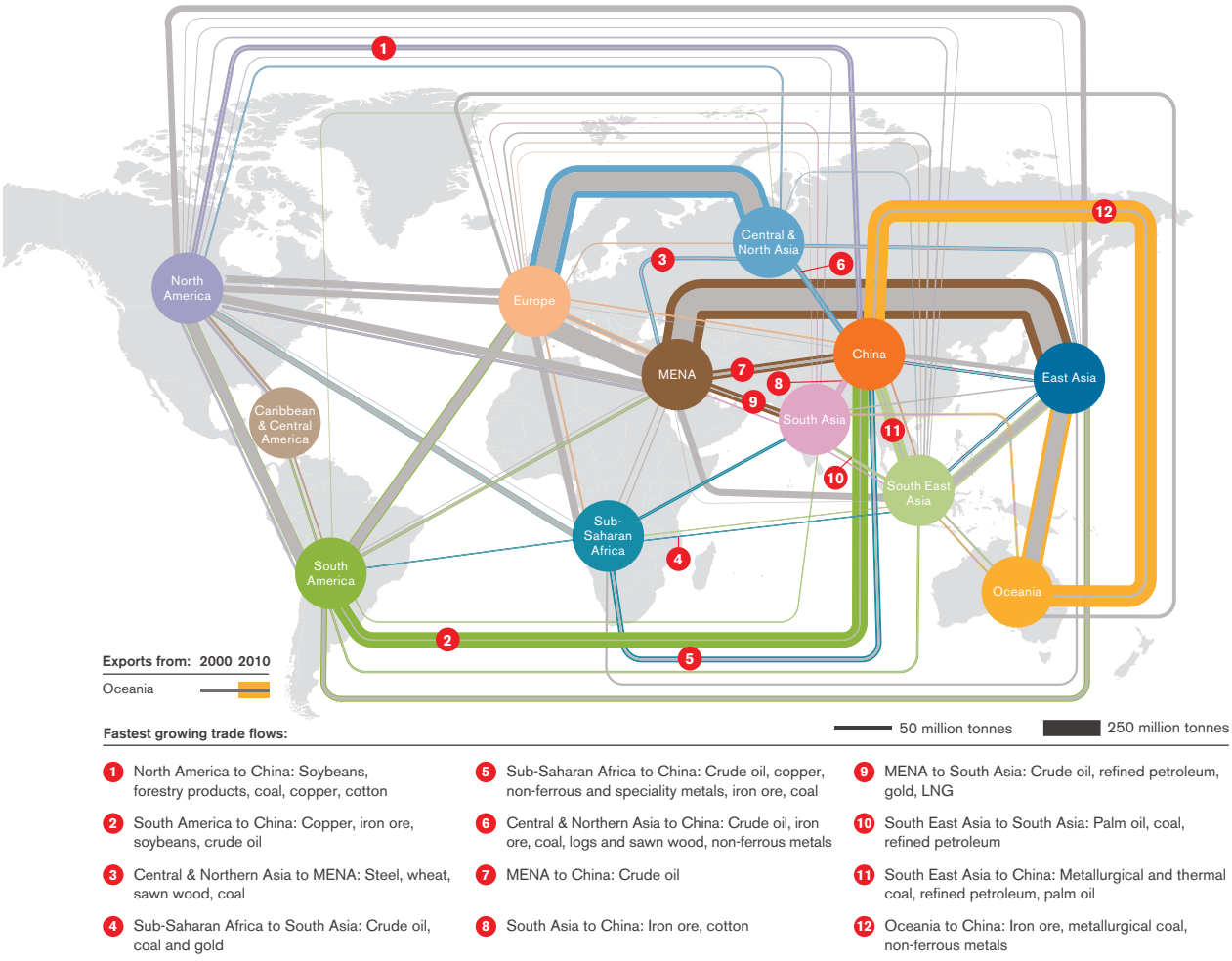
The markets for critical resources have always been political. States have often taken action to preserve access to resources for their own economies – whether through direct interventions or via proxies. But higher prices and higher volatility have increased the stakes within and between countries. Compulsory nationalization or the assumption of a controlling interest, the confiscation of foreign-owned assets, windfall profit taxes and similar measures may become more common in an era of fluctuating prices.

Many of the political and economic realignments are already under way. Middle Eastern importers of food and Asian importers of raw materials – keen to guarantee access in an era of potential resource scarcity – are building economic and trade relationships with the major producing regions. In turn, producer countries have responded with policy measures of their own. With production concentrated among a few major exporters, OPEC could be joined by new international cartels in other resource markets if high prices persist.

The proliferation of SOEs or sovereign wealth funds in overseas resource sectors has generated renewed fears that they will serve as blunt instruments for the interests of foreign governments. SOEs are criticized for having non-commercial objectives, such as tying up deals overseas to feed their domestic economies with cheap resources.

But the evidence so far is mixed, and the extent to which SOEs are or can be directed by governments varies considerably. Physical ownership of assets and supply chains could indeed be an advantage in times of major crisis. For most countries, however, access to functioning global markets remains the best source of resource security.

Figure D: Key resource trade relationships (by weight), 2000 and 2010



Source: Chatham House Resource Trade Database (2012).

5. Collaborative governance is the only option

The political economy of natural resources is increasingly shaped by the large, structural shifts under way in the world – whether in the changing natural environment, in the deepening interrelationship between resource systems, or in the rebalancing of global income and power. The world must now contend not just with growing environmental threats such as climate change and water scarcities, but also with the shift in consumer power from West to East, the concentration of resource ownership and the rise of state capitalism. All these moving pieces are changing the rules of the resources game.

In this context, investment in the environmental and social resilience of developing economies will be critical to long-term global resource security. There is a window of opportunity for leadership by OECD countries to help tackle the challenges facing new producers such as Mongolia. These include weak infrastructure, low-skilled workforces, water scarcity and political instability – all adding up to an unfavourable investment climate that may threaten long-term production prospects. In addition, emerging economies such as China, India and Brazil must become partners with the OECD in these undertakings to avoid destructive, 'race to the bottom' competition.

Existing international institutions are not up to the task of dealing with volatile markets. There have been no credible international policy responses to volatile resource prices, even though this challenge requires urgent policy innovation. For example, in the case of food, no rules or agreements are in place to deal with export controls, coordinate stockholdings or reduce the impacts of biofuel mandates on food prices. Repeated attempts to discuss such approaches have been stalled by conflicting politics and the needs of individual governments to protect particular domestic interests.

The blindness of standard policy prescriptions to resource politics could worsen the future outlook and undermine sound economic choices. To help ensure the world is equipped to move towards a new resource equilibrium under stress conditions, it will be critical to manage perceptions, expectations and fears of resource scarcity in a collaborative manner. It will be equally necessary to mitigate excessive politicization of resource markets and trade that could bring about worst-case scenarios. New modes of engagement also become critical as the centres of key decision-making on resources become diffused beyond traditional powers. It is not just a question of depoliticizing the resources debate, but of creating new structures and dialogues to make the politics of strong resource governance and good economics easier.

Recommendations

To avoid sleepwalking into a prolonged era of resource-related strife, the report makes ten top-line recommendations.

Fostering new leadership

1. To galvanize innovative thinking and change the status quo, this report proposes the formation of a new club of the world's principal resource-producing and -consuming countries to fill existing governance gaps on resource and scarcities governance (see Table A). This 'Resources 30' or R30 grouping, conceived as a 'coalition of the committed', would comprise leaders and officials from thirty countries of systemic significance as resource producers, consumers, importers or exporters.

   The R30 could provide an informal but dedicated forum where governments and stakeholders can address specific resource-related issues, including

tackling price volatility at the sectoral level, devising guidelines on the use of export restrictions, and encouraging transparency of state-owned enterprises. Other stakeholders could also be invited to engage in an expert or observer capacity. The findings of these meetings could feed into existing international institutions, such as the International Energy Agency (IEA), WTO and G20.

Reducing vulnerability to short-term shocks

2. Mechanisms to reduce the impacts of short-term commodity price shocks should be explored in existing international institutions or in newly formed groupings of governments.

    - ***Oil:*** Efforts should be accelerated to expand or link the IEA's emergency sharing mechanism to those in the emerging economies, especially China and India. Another idea would be to introduce a new system to enable the companies critical to fuel supply to access a percentage of national reserves in case of *force majeure* without prior government approval. This would help mitigate localized disruptions before they feed into international markets.

    - ***Food:*** Major grain-based and oilseed-based biofuel-producing countries could collectively purchase call options from their biofuel industries. This arrangement would act as a virtual global food reserve. These contracts could specify a trigger – based on a price index – which when activated would obligate the producer to release feedstock back into food chains.

    - ***Metals:*** Global data and transparency on metals production, trade and stock levels should be enhanced. Stockholding figures from traders could be collated by an escrow service and published in aggregated form. The work of the international commodity study groups for zinc, copper and other metals could also be brought together as a publicly accessible data hub and expanded to include production data for all key metals, in virgin and secondary markets.

3. Guidelines on forgoing the use of export restrictions in times of commodity price crisis could be adopted as either an informal pledge or a plurilateral agreement at the WTO.

Investing in sustainable production and resilience

4. Clear policy incentives, government procurement rules, market creation schemes and pricing structures that reflect the full environmental and social impacts are needed at the national level to incentivize higher resource productivity and efficiency.

5. It will be critical to engage the next wave of new resource producers and consumers in constructive dialogues and initiatives. R30 or G20 governments could provide support to improve transparency, manage

export and import dependencies, and strengthen environmental resilience in infrastructural investment and climate adaptation, especially in low-capacity producer states.

6. The elimination of environmentally perverse subsidies must be a global priority; any multilateral plan of action will require a clear timeline, concrete support for poorer states to reform their resource pricing, as well as effective channels and fora to share experience and technical expertise.

7. Water-sharing agreements at catchment level need to provide flexibility and adaptability against future environmental changes. Also important are efforts to strengthen collection and monitoring of water-related data. Donors should support the roll-out of drip irrigation in rural areas, as should investors in land transfers.

Reinvigorating rule-based resource governance

8. Criteria should be established (including for moratoria) to govern resource production or extraction in areas of significant biodiversity or ecological sensitivity, such as the deep sea or the Arctic, where effective mitigation efforts or remedies are not available or affordable.

9. Extreme engineering options are likely to become increasingly popular in a resource-constrained world. For this reason, relevant ministries, businesses and industry associations should discuss and implement national or local governance mechanisms and best practice on extreme responses such as weather modification.

10. An annual 'State of the World's Resources' report or an international resources data bank could be launched to standardize in a transparent manner the collection and sharing of data on resource endowments, stocks and trade figures. Such an initiative would benefit from parallel efforts, supported perhaps by charitable foundations, to increase the capacity of civil society and local communities and media to monitor resource usage and extraction at the local level.

Table A: Candidates for the R30

R30	Key producer	Key consumer	Key exporter	Key importer	Description
Australia	●		●		Key mining country especially for coal and iron ore. Also an expanding gas producer and a large agricultural exporter.
Brazil	●	●	●		Key agricultural producer and iron ore exporter. Expanding oil producer with significant reserves in offshore pre-salt fields. Large consumer especially of agricultural products, with fast growing energy and metal consumption.
Canada	●		●	●	Expanding (mainly unconventional) oil and gas producer. Major farming and mining industry. Large importer of both unprocessed and intermediate oil and metal products.
Chile	●		●		Largest copper producer today. Responsible for a third of world production.
China (incl. Hong Kong)	●	●	●	●	Major and fast-growing coal, metal, and food producer and consumer. Top importer of metals and forestry products, and fast-growing importer of fossil fuels and some agricultural products. Large exporter of metals and agricultural and fishery products.
EU27	●	●	●	●	Key consumer and importer of fossil fuels and metals. Major producer, exporter, and importer of agricultural and fisheries products.
France				●	Large importer mainly of fossil fuels.
Germany				●	Large economy with significant industrial sector, which is dependent on imports especially of fossil fuels, metals and minerals.
India	●	●	●	●	Major agricultural producer as well as large iron ore, bauxite and coal miner. Large exporter especially of iron ore. Expanding economy with major growth potential and rapid growth in import demand, especially for fossil fuels.
Indonesia	●	●	●	●	Key producer and exporter for coal, selected metals and many agricultural and forestry products such as palm oil. Large importer of fossil fuels. Expanding consumer with large growth potential due to size of its population.
Iran			●		Key oil and gas producer and exporter, with second largest conventional gas reserves.
Italy				●	Large importer of metals, fossil fuels and agricultural products.
Japan		●	●	●	Key consumer and importer of fossil fuels and metals, mainly for its large industrial sector, as well as significant importer of agricultural products. Large fisheries sector.
Malaysia			●		Key producer, consumer and exporter of palm oil. Importer of metals, agricultural products, and petroleum products.
Mexico			●	●	Large exporter of fossil fuels and some agricultural products. Heavily reliant on imports, especially for select agricultural and forestry products.
Netherlands				●	Resource trading hub for Europe centred on the third largest port in the world. Significant importer of fossil fuels and selected agricultural commodities.
Nigeria			●		Significant producer and exporter of petroleum and petroleum products.
Norway			●		Large (mainly offshore) oil and gas producer. Large fisheries sector.
Russia	●	●	●		Key oil and gas producer with large, mainly Arctic and sub-Arctic reserves. Major producer and exporter of metals (such as steel and nickel) and agricultural products (especially wheat).
Saudi Arabia	●		●		World's largest petroleum producer and exporter with the world's largest oil reserves. Growing importer of agricultural products.
Singapore			●	●	Large fossil fuel refining and trading hub.
South Korea			●	●	Large and resource-intense industrial sector, heavily reliant in particular on fossil fuels and metal imports. Significant exporter of refined oil and processed metals and large importer of agricultural products.
Spain				●	Large importer mainly of fossil fuels but also some metals and agricultural products.
Switzerland				●	Large importer of fossil fuels and significant trading and processing hub for metals.
Thailand				●	Large and growing importer of metals and fossil fuels for its expanding manufacturing sector. Large producer and exporter of rice and other agricultural products.
Turkey				●	Large fossil fuel importer and growing importer of metals and agricultural products. World's largest iron and steel scrap importer as raw material for its expanding steel industry.
UAE			●		Key oil producer and exporter. Growing importer of agricultural products.
United Kingdom				●	Large but declining oil and gas producer. Large importer of fossil fuels and metals, especially gold.
United States	●	●	●	●	Key agricultural and fossil fuel producer and a large mining sector. Key exporter of agricultural products and large importer of metals. Key fossil fuel importer but with falling import dependence due to consumption peak and expanding (unconventional) production.
Venezuela			●		Large producer of oil and key oil and gas exporter.

Key Facts

Agriculture

- Average prices for agricultural commodities are set to rise. By 2050, global demand for food is expected to have increased by 70–100%. Global cereal demand is increasing at 1.3% per year; average yields are growing at 0.9%.
- Volatility in agricultural commodities markets will persist. Global cereal stock-to-use ratios are at crisis levels below 20%, and will struggle to recover as demand continues to outstrip productivity growth.
- Climate change and extreme weather will become a growing problem for global food security, triggering regional food crises and global price spikes whenever they hit key production centres. Agriculture accounts for 70% of freshwater withdrawals worldwide, and up to 90% in developing countries.
- Agricultural trade remains dependent on a small number of key export centres, increasing the risks of extreme weather. North and South America are the only two major export centres, while palm oil production is almost entirely concentrated in Indonesia and neighbouring Malaysia. Growing export capacity in the Black Sea region is highly variable and vulnerable to extreme weather.
- New trade flows are creating new interdependencies and new risks. Cereal imports for the MENA region from Russia and Ukraine have overtaken those from either the EU or the US, growing from 750,000 tons to more than 24 million tons – the risks of which became clear in 2011. Booming Chinese meat consumption has seen global soybean trade reorganize itself between China and South America.
- Concentration of production increases the risks of unilateral actions. During the 2008 crisis over 30 governments imposed export controls, bringing agricultural markets to the edge. In 2011, Russia's export ban on wheat drove up international prices and led to the initial protests in North Africa that became the Arab Spring. Emerging regional production centres for key commodities such as wheat, rice and soybeans also raise the prospect of cartels.
- The sheer scale of China's strategic food reserves and its levels of production and consumption mean that tight agricultural markets are highly sensitive to changes in China's net trade position. A critical uncertainty is how long China's policy of self-sufficiency in grains can be maintained, given the rising demand and environmental constraints it faces, and how any such retreat from this policy would be implemented.

Metals

- China is the dominant metals consumer. Its share of global metals consumption will increase from 40% today to about 50% in 2020, despite the current slowdown. Many mining countries –including Australia, India, Peru, Brazil and Chile – have become increasingly dependent on exports to China. Of all the metals traded worldwide, 45% goes to China – more than the sum total of the 20 next largest importers.
- Between 2000 and 2010, China increased its production in iron ore by 233%, bauxite by 293%, zinc by 150% and copper by 124%, becoming the largest iron ore, zinc and tin producer, second largest bauxite producer, and third largest copper producer in the world.
- Even with the largest mining industry in the world, China is increasingly import-dependent for most metals. Domestic sources, for example, provide only 37% of the aluminium, 29% of the iron and 26% of the copper its economy requires.
- Future availability is not in question and there have been large additions to global proven reserves over the past decade. But reserve data are a poor proxy for future supply. Many greenfield projects located outside traditional mining countries face multiple challenges. Citigroup suggests that a quarter of these may not be developed before 2020, with a further 40% at risk.

- Adding to the supply challenge are declining ore grades. While iron and bauxite mining may remain stable, zinc, lead and particularly copper and nickel will be affected by declining ore grades, as will precious metals such as gold and platinum.
- Mining investments have increased more than fourfold in the last decade to nearly $80 billion per year. Sustained large-scale investment will remain necessary to meet future demand but is threatened by cutbacks related to the recent weakening of metal prices.
- A number of emerging economies such as Indonesia have either imposed or are considering new export restrictions on a variety of metals. China and India would be among the hardest hit by these bans.

Energy

- The last decade saw the share of global fossil fuel trade going to China and India more than doubling in value terms (from 4.4% to 10.8%) and tripling in weight terms (from 4.5% to 14.3%).
- Over the next 20 years, this trend will reinforce geostrategic interests between Asian consumers and energy exporters – particularly the Persian Gulf and sub-Saharan Africa for oil, Russia and Qatar for gas, and Indonesia and Australia for coal.
- Some of the traditional exporters of energy have also emerged as the fastest-growing consumers of energy over the last decade: e.g. Saudi Arabia for oil (6%), Indonesia and Vietnam for coal (9% and 12% respectively) and Egypt and Thailand for gas (10% and 8% respectively). This may affect the ability of some to maintain export volumes in future.
- With the dramatic growth of shale gas in the United States, global energy projections have been redrawn. China rather than Europe will be the next test case for unconventional gas development, with state companies directed to produce 30 bcm of gas from coalbed methane and shale by 2015 – more than double China's 2008 natural gas import volume.
- The global coal market is being reshaped by the import profiles of China and India – the world's largest and third largest coal producers respectively. With its expected increases in coal-fired power generation, India's demand is projected to be 20% of today's world coal trade and could overtake China's volume of imports after 2020.
- Heavier volumes of energy trade together with a changing climate, extreme weather events and water stress will increase the vulnerability of the global energy production and transportation systems. Much of existing and planned infrastructure will be at risk from storm damage, rising sea levels and the effects of melting permafrost.
- Water and energy provision will be increasingly interdependent. The hydropower sector will feel the effects of water stress most directly – leading to vulnerabilities in hydro-dependent regions in Latin America, South Asia and sub-Saharan Africa. Power generation and heavy hydrocarbons extraction and transformation processes (particularly coal and tar sands) are likely to compete with water resources in already water-stressed areas by 2030, e.g. in India, China and South Africa. The perception of unequal access to clean water will be a serious potential trigger of conflict and instability.
- Current mechanisms are inadequate to deal with oil supply shocks, particularly with the rise of new consumers not included in the IEA's emergency sharing mechanism. The 28 IEA member countries hold most of the world's strategic oil stocks but China and India have also begun to develop significant stockpiles, with China planning to expand them to 90 days' worth of imports (476 million barrels) by 2020.
- Flashpoints for competition and possible conflict over hydrocarbon resources include the East and South China Seas, the South Atlantic, the Arctic Ocean and East Africa.

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