Environment-schmironment

Climate change through a finance & liability risk lens

Sarah Barker
Global Head of Climate Risk Governance, MinterEllison

Crawford Fund Annual Conference, Canberra, 13 August 2019

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Overview

1. Climate evolution: from ‘environmental’ to ‘financial’ issue

a. The three categories of climate-related financial risk
b. Physical risk impacts: latest science
c. Connecting the dots: food supply chain industry exposures

2. Economic transition risks

a. Policy and regulatory responses
b. Technological developments
c. Stakeholder expectations: equity investors, debt markets, regulators, insurers & society

3. Opportunities

a. The sustainable finance revolution

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1. Climate change: the evolution

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Climate change: undeniably a foreseeable financial risk issue

BANK OF ENGLAND
PRUDENTIAL REGULATION AUTHORITY

Three categories of climate-related financial risks

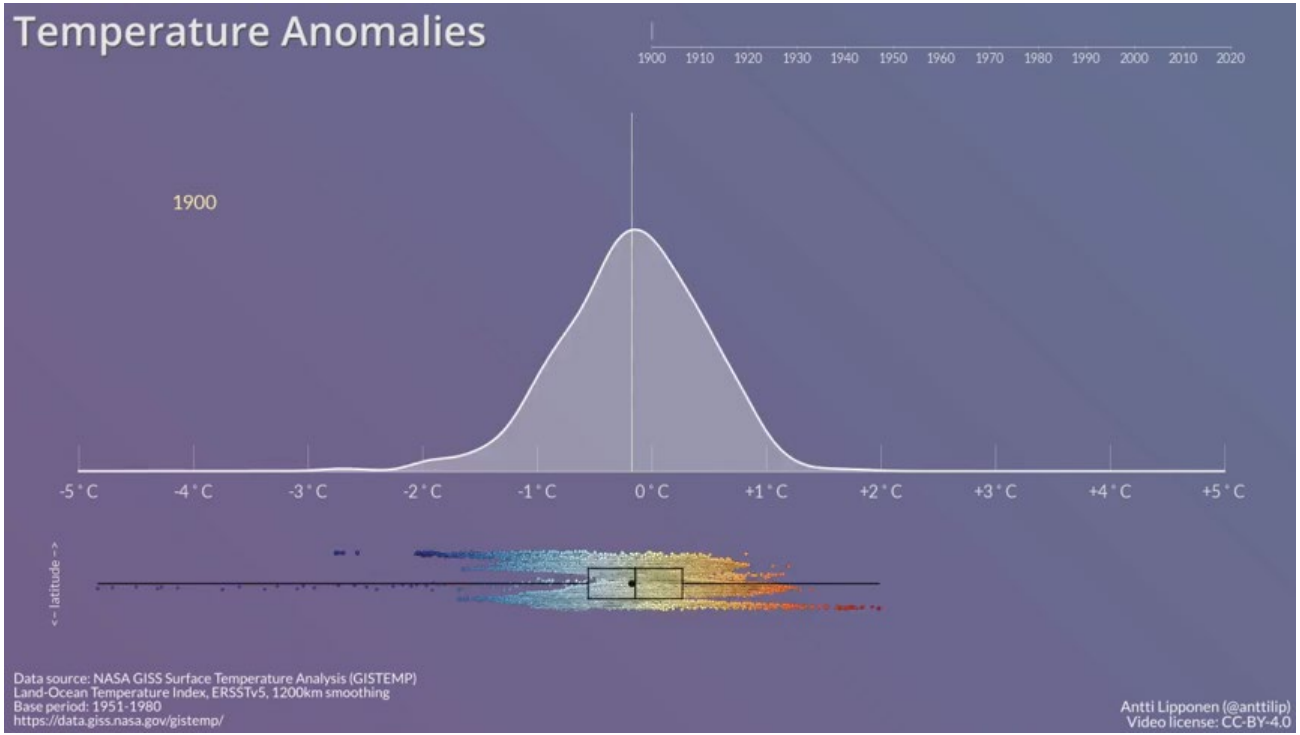
Physical	***ecological impacts**: gradual onset + extreme catastrophic*
Economic transition	***market impacts** driven by policy, technology, social responses to those physical risks*
Liability	***failure** to mitigate, adapt or disclose*

These risks manifest within mainstream investment horizons – including the shorter term

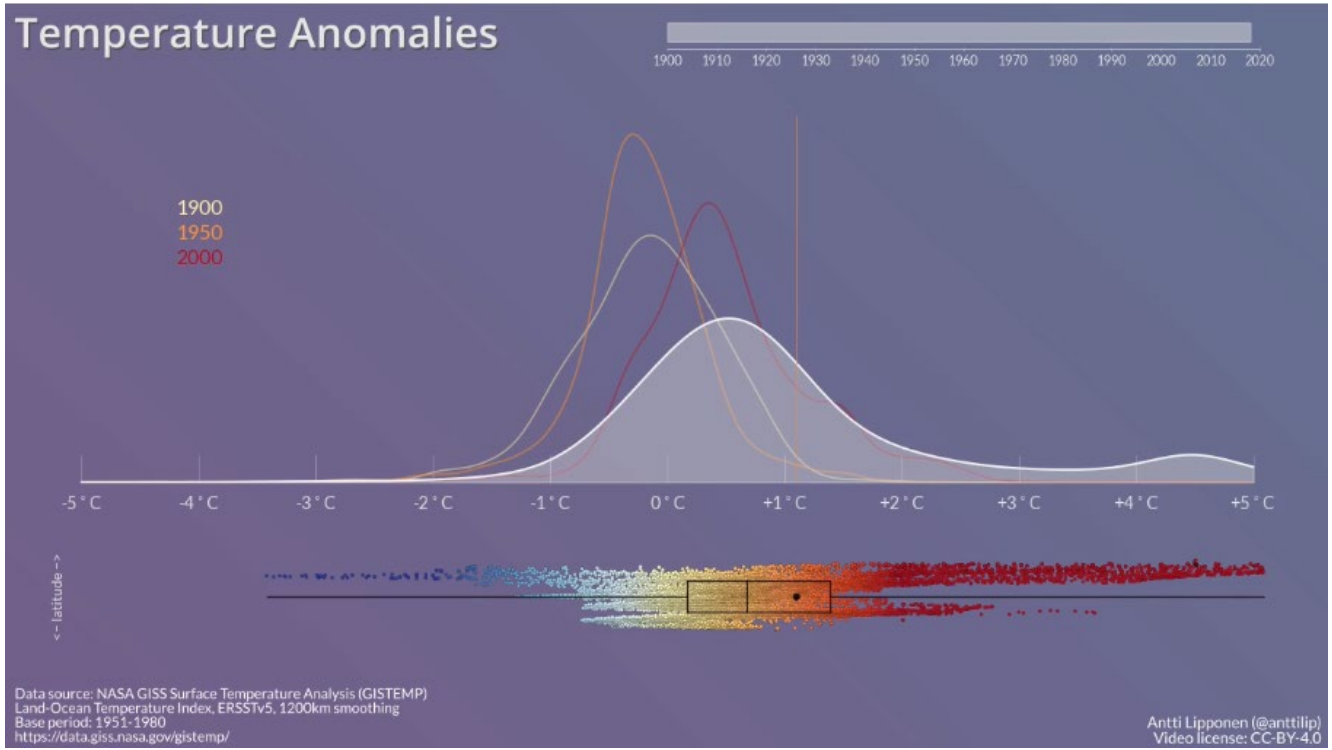
What, how, when and why?

- *What?*
  - Climate change – ‘greenhouse effect’
- *How and why?*
  - Primarily emissions of carbon dioxide, methane etc from human activities: combustion of fossil fuels (energy, transport, industry, manufacturing); agriculture (livestock); land use change and clearing
- *When?*
  - Pre-industrial 280ppm vs 415ppm CO2e now – already average planetary temp approx. 1.1°C above pre-industrial average
  - ‘Business as usual’ emissions: 4+°C above pre-industrial average by 2100
- *Who says so?*
  - Scientific consensus – IPCC (2018), NASA, WMO etc etc – *as scientifically certain as gravity*

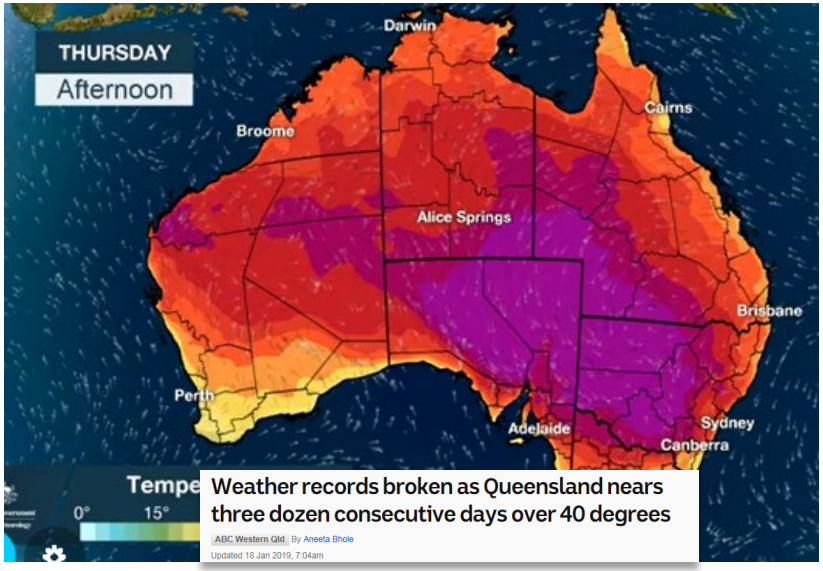
Changes are *already* here…



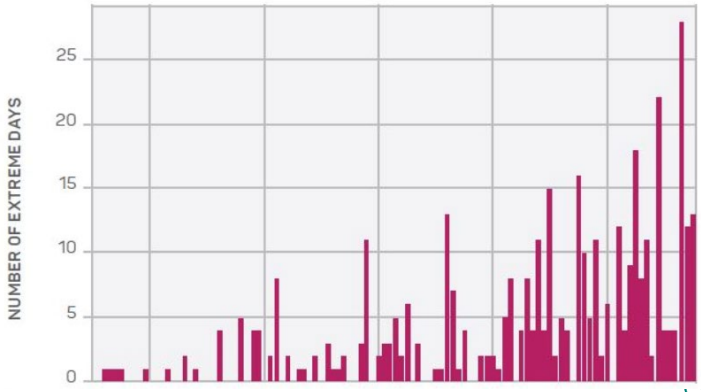
Changes are *already* here…



Baseline shifts above historical norms



Increase in number of extreme heat days >35C (1940-2015)



Australian Institute for Disaster Resilience

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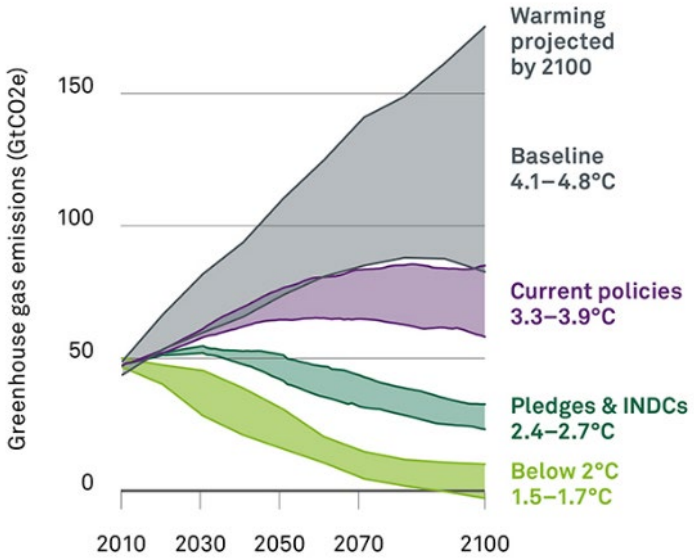
Physical risk: so what?

Potential climate pathways to 2100



Black Rock Investment Institute, Sept 2016

+1.1°C *now*	1.5°C *As early as 2024*	2°C *As early as 2036*	4+°C *2100 – locked in mid-century*
Significant increase in extreme heat days	14% of global population subject to extreme heat	37% global pop'n subject to extreme heat	Highest temperatures in 30 million years
Sea level rise 20cm+ (3.4mm per year)	8% plants >50% range	16% of plants lose >50% range	Glacial melt compromises fresh water sources
Increased variability in rainfall	6% insects >50% range	18% insects lose >50% range	Drought over 40% inhabited land
Increased drought, fire conditions	90% decline coral reefs	99% decline reefs	Sea level rise 6 feet+
2,000 species rendered extinct due to climate change in last half century (8% of total 25,000 species extinctions)	1.5m tonne decline in fisheries catch	3m tonne decline in fisheries catch	Extinction of >50% of all known terrestrial and marine species
	Sea levels 40cm+	Sea levels 50cm+	
	4% global land ecosystems transform	13% global land ecosystems transform	

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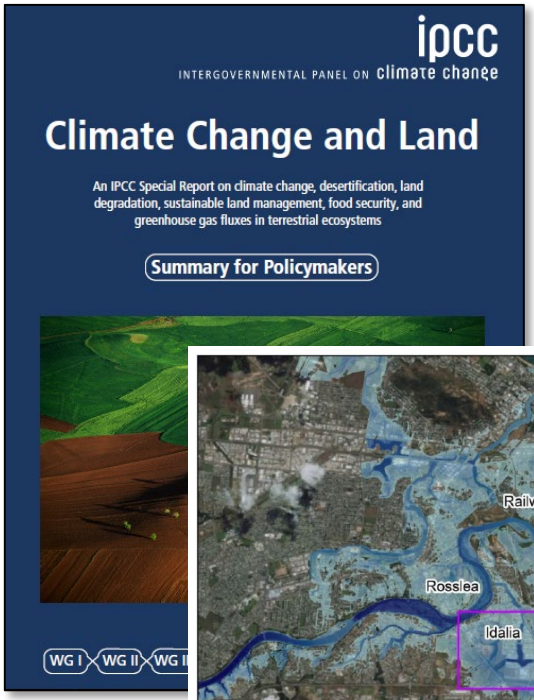
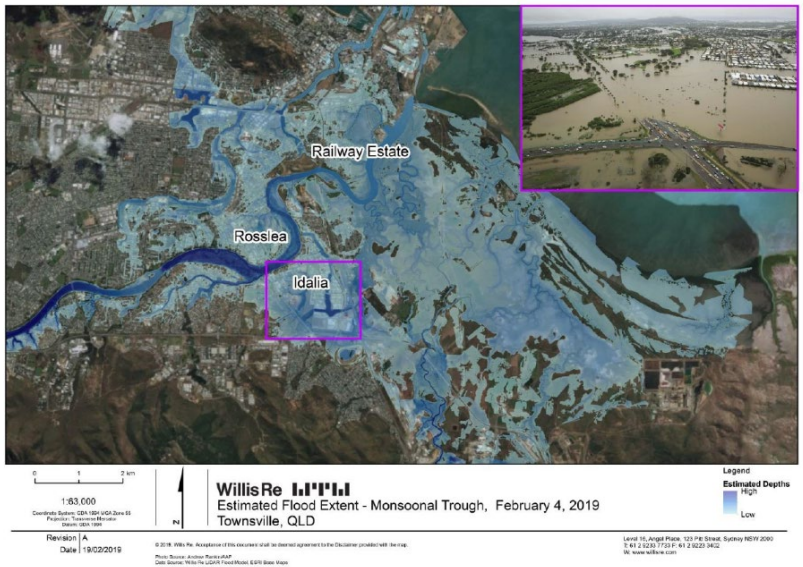
Connecting the dots to the food sector….





- Water scarcity?
- Inundation (coastal & fresh water)?
- Expanding cyclone/hurricane zones?

- Increase in average temperatures (heat stress – workers and equipment; spoilage)?
- Soil denutrification?
- Changes in crop growth cycles and nutrient densities?
- Pest / disease control?
- Ocean acidification and fresh water / deoxygenation / putrification?
- Infrastructure and community vulnerability, adaptation and resilience?
- Supply chain integrity?

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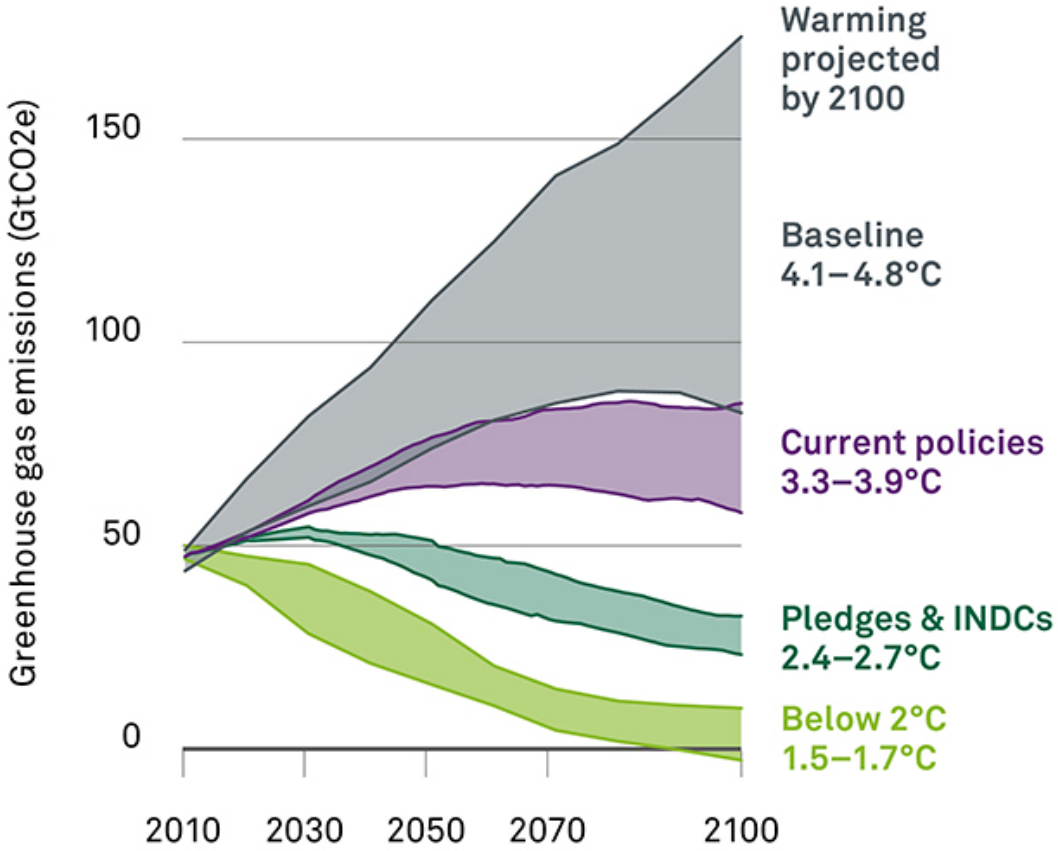
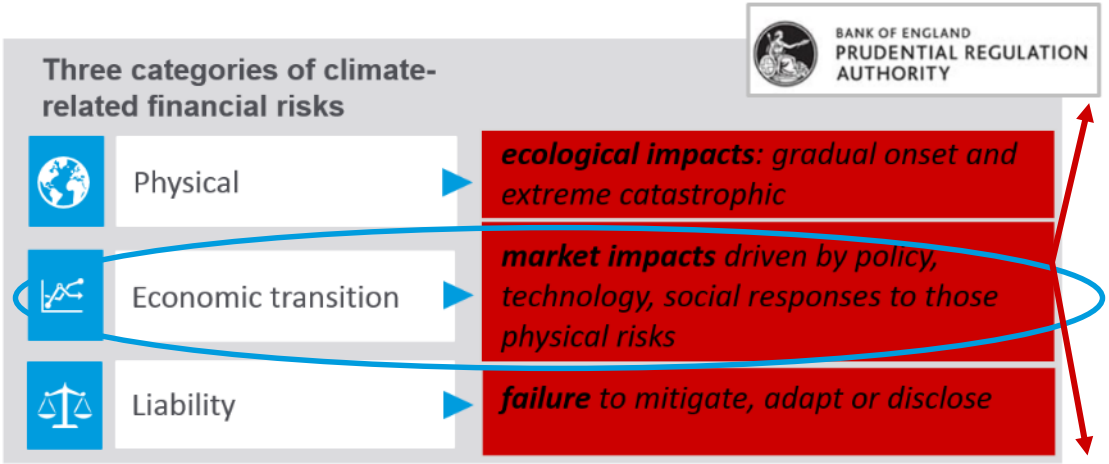
Potential climate pathways to 2100



2. Economic transition impacts

Economic transition risks & opportunities



- **Policy & regulatory shifts**
- **Technological dev'mts**
- **Shifts in stakeholder preferences**
  - Equity investors
  - Debt markets
  - Insurers
  - Prudential & securities regulators ('soft law')
  - Social preferences

Policy & regulatory?

NEWS / SOUTH AFRICA

Coal-hungry South Africa introduces carbon tax

The tax will be levied from June 1 on greenhouse gases from fuel combustion, and industrial processes and emissions.

PARIS AGREEMENT

UNITED NATIONS
2015

The Parties to this Agreement,

Being Parties to the United Nations Framework Convention on Climate Change, hereinafter referred to as "the Convention",

Pursuant to the Durban Platform for Enhanced Action established by decision 1/CP.17 of the Conference of the Parties to the Convention at its seventeenth session,

In pursuit of the objective of the Convention, and being guided by its principles, including the principle of equity and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances,

Recognizing the need for an effective and progressive response to the urgent threat of climate change on the basis of the best available scientific knowledge,

Also recognizing the specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, as provided for in the Convention,

Taking full account of the specific needs and special situations of the least developed countries with regard to funding and transfer of technology,

Recognizing that Parties may be affected not only by climate change, but also by the impacts of the measures taken in response to it,

Emphasizing the intrinsic relationship that climate change actions, responses and impacts have with equitable access to sustainable development and eradication of poverty,

Recognizing the ... ending hunger, and the ... adverse impacts of cli...

WORLD EUROPE CLIMATE POLICY

Zero emissions: UK aims to be first of G7 with 'ambitious' target

Germany to stop using coal by end of 2038

A government commission has agreed that Germany should phase out all coal-fired power plants by the end of 2038. The government is already planning to shut down nuclear power plants over the next three years.

New Zealand introduces bill for zero carbon emissions by 2050

Jacinda Ardern says law will address climate change but faces opposition from farmers over plans to reduce methane emissions

▲ The New Zealand National party says methane reduction targets for the country's huge dairy sector are too high. Photograph: William West/AFP/Getty Images

Stakeholder shifts

June 13, 2019 03:26 PM

Millennials have a role in the plastics industry, if companies can attract them

FRANK ESPOSITO

Plastics News Staff

TWEET SHARE SHARE EMAIL

"Dirty, Difficult, And Dangerous": Why Millennials Won't Work In Oil

By Tsvetana Paraskova - Jul 19, 2017, 6:00 PM CDT

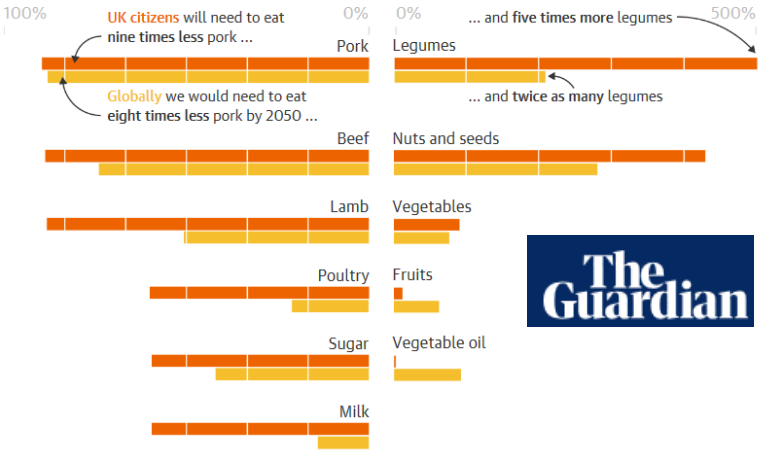
FINANCIAL REVIEW

Miners urged to tackle image problem among Millennials

Huge reduction in meat-eating 'essential' to avoid climate breakdown

To keep global temperature rises to under 2C by 2050, we need to eat much less of these foods ...

... and much more of these



The Guardian

Guardian graphic. Source: Nature

Beyond Meat surges 163% in the best IPO so far in 2019

CNBC

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Equity markets?

NORGES BANK INVESTMENT MANAGEMENT

Vanguard

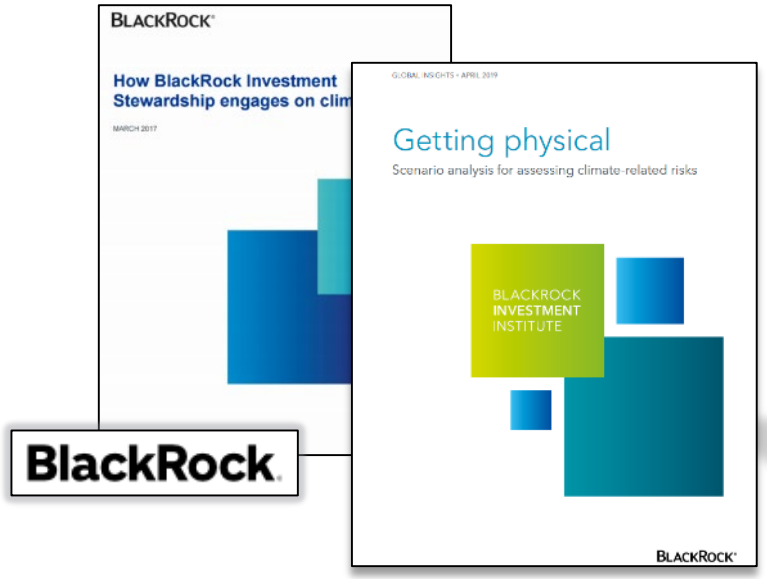
Legal & General

PIMCO

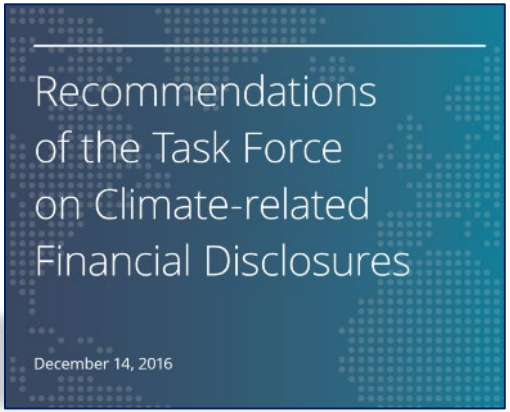
STATE STREET

Schroders

BNY MELLON



Climate Action 100+



Debt markets? Credit ratings

- Physical geography; transition industry/commodity; company-specific (exposure + preparedness)

FitchRatings Moody's S&P Global

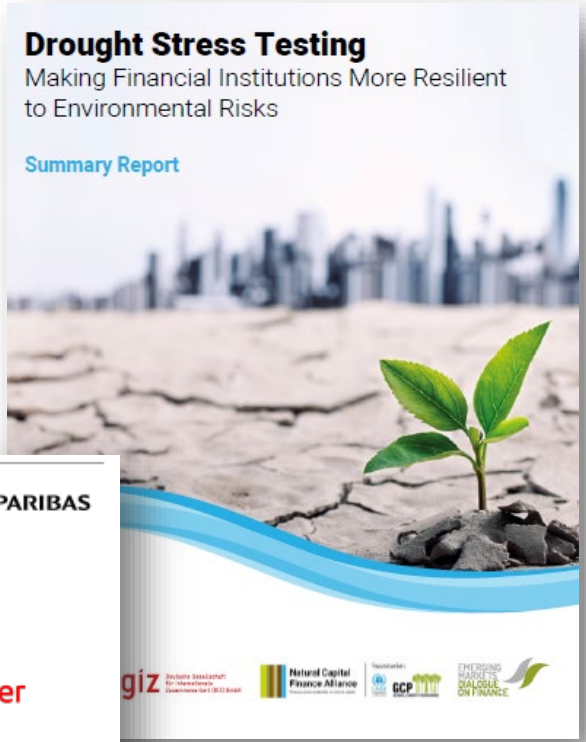
Climate Change Is A Global Mega-Trend For Sovereign Risk

STANDARD & POOR'S RATINGS SERVICES
McGRAW HILL FINANCIAL

Vulnerability To Climate Change

Overall ranking	Sovereign	Population living below five meters altitude (2000)		Agriculture as share of GDP (2012)		GAI Vulnerability Index (2012)	
		Rank	(%)	Rank	(%)	Rank	Index
116	Cambodia	90	10.6	113	35.6	106	0.500
115	Vietnam	112	42.8	103	19.7	90	0.381
114	Bangladesh	98	14.0	100	17.7	104	0.495
113	Senegal	100	14.8	96	16.7	100	0.472
112	Mozambique	71	6.5	109	30.3	109	0.514

In commercial lending practice?



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CLIENT	RATING (S&P)	RISK (R$ MM)	NUMBER OF STATES	NUMBER OF CROP TYPES
Client 1	BBB	391.8	1	5
Client 2	BB+	129.3	1	3
Client 3	BBB	115.5	1	
Client 4	BB-	112.3	1	
Client 5	BB	108.7	1	
Client 6	BB-	107.6	1	
Client 7	BB	84.1	1	
Client 8	B	55.7	2	
Client 9	BB-	55.3	1	
Client 10	B	44.1	3	
Client 11	BB-	42.0	1	
Client 12	BB-	41.2	4	
Client 13	B	39.5	1	
Client 14	B	17.2	2	

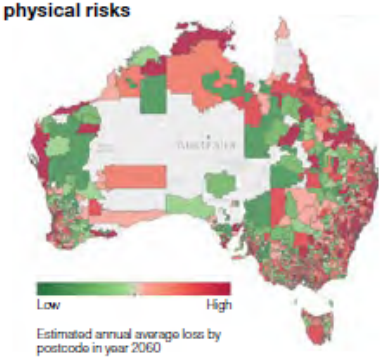
Table 3.3. Impact of incremental climate change risk on the financial variables of the sample of agricultural sector clients for the 2040s 4°C scenario compared to the present-day (baseline)

CLIENT	REVENUE CHANGE (%)
Client 1	-12
Client 2	-4
Client 3	22
Client 4	-16
Client 5	-14
Client 6	-13
Client 7	-3
Client 8	-2
Client 9	-4
Client 10	-2
Client 11	-10
Client 12	-8
Client 13	-11
Client 14	-8

CBA Annual Report 2018

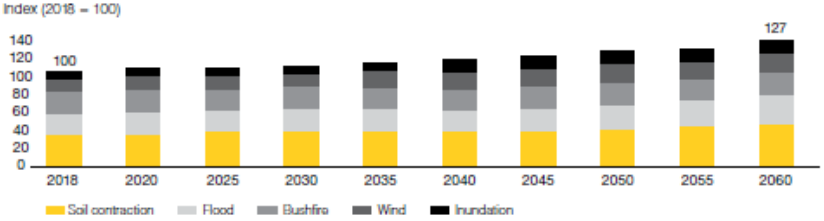
Estimated annual average losses to customers from physical risks

Impact	Customers facing increasing repair and replacement costs for physical damage to their properties.
Findings	Under the high emissions (RCP 8.5) scenario, if we were to continue to lend in these areas, the estimated annual average losses to customers across our home lending portfolio are expected to increase by 27% by 2060 – this is less than 1% per annum. The largest contributor to these losses currently arises from soil contraction, but the modeling shows that coastal inundation losses could increase by 71% by 2060, primarily due to sea level rises.



Estimated annual average loss by postcode in year 2060

Estimated annual average loss by peril



High risk properties

To better understand our potential credit risk, we have estimated the part of our current portfolio which may be high risk, where this is located and how it could change over time. We have considered high risk to be properties where the increase in insurance costs from 2018 as a

Estimated % of portfolio (outstanding balance) considered high risk

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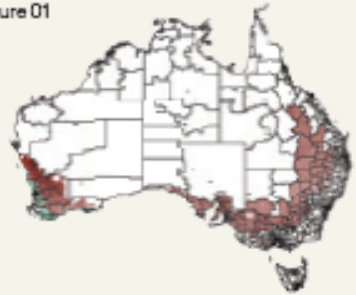
FY19

Climate simulation: impact on farm profitability by 2060

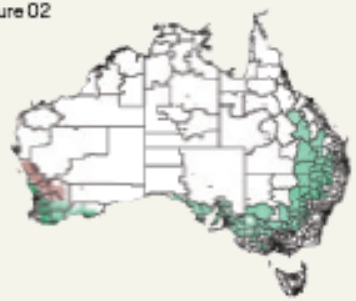
Grains
Worst case without adaptation

Figure 01



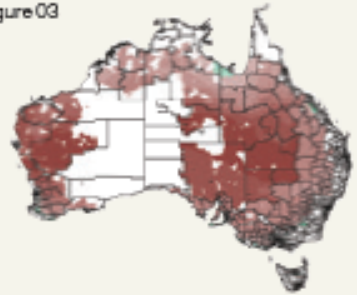
Worst case with adaptation (ex GMOs)

Figure 02



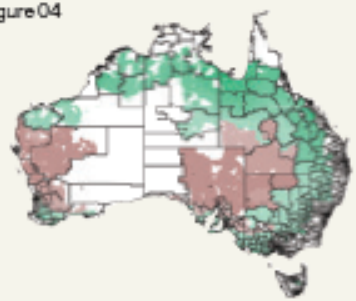
Livestock
Worst case without adaptation

Figure 03



Worst case with adaptation (ex GMOs)

Figure 04

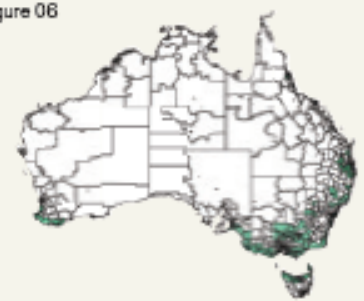


Dairy
Worst case without adaptation

Figure 05

Worst case with adaptation (ex GMOs)

Figure 06



% change in farm profitability -50% +110%

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Insurance?

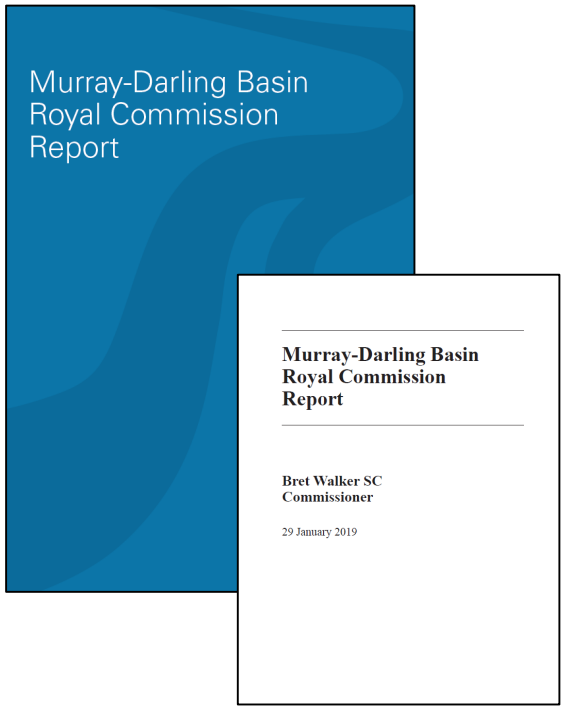
Climate change on track to make world 'uninsurable': IAG

FINANCIAL REVIEW

If we don't rapidly reduce greenhouse gas emissions, by 2030 about 1 in every 19 properties could have effectively unaffordable insurance premiums.

Climate change and extreme weather are projected to reduce property values by $571 billion by 2030, $611 billion by 2050 and $770 billion by 2100.

The OTHER Royal Commission



- '…climate change…appears to be regarded by the MDBA as a factor to be dealt with by the same mundane operational flexibility as the system always has displayed in order to cope with 'normal' variability.'
- …Science, as that term should be understood, was not used. The MDBA has failed to disclose key matters, such as its modelling. Science is open, available, and can be critiqued and checked. It can be validated or invalidated.
- [The MDBA's failure to conduct] any review of climate change risks to the Basin…demonstrates ongoing negligence by the MDBA. It is a dereliction of its duties. It is not just indefensible, but incomprehensible…'

A few more choice words

- ‘Politics rather than science ultimately drove the setting of the Basin-wide SDL and the recovery figure of 2750 GL. The recovery amount had to start with a ‘2’. This was not a scientific determination, but one made by senior management and the Board of the MDBA. It is an unlawful approach. It is maladministration.
- In 2011, management of the MDBA improperly pressured the CSIRO to alter parts of the CSIRO’s ‘Multiple Benefits’ report. This rendered parts of that report misleading, as they no longer reflected the views of, at the very least, Dr Matthew Colloff, who was one of the authors. The CSIRO should not have agreed to the changes that were made. This conduct too represents maladministration.

- Regrettably…the MDBA has shown itself to be unwilling or incapable of acting lawfully. …there are serious doubts whether the current senior management and Board are capable of fulfilling their statutory obligations and functions.
- The assertion by the MDBA that climate change projections could not be incorporated into the modelling because they were too uncertain is rejected.
- [The MDBA’s failure to conduct] any review of climate change risks to the Basin… demonstrates ongoing negligence. It is a dereliction of its duties. It is not just indefensible, but incomprehensible.
- Any assertion by the MDBA that climate change can be incorporated into the Basin Plan modelling at its 10-yearly review, or at some later date, is misplaced. Climate change is happening now, and can occur quickly. Deferral to a later date…is nonsensical in a policy sense as well as unlawful.

The ratchet: heightened expectations in FY19?

3. The good news: finance *opportunities* for the food sector

Opportunities - the sustainable finance (r)evolution

GREEN BONDS

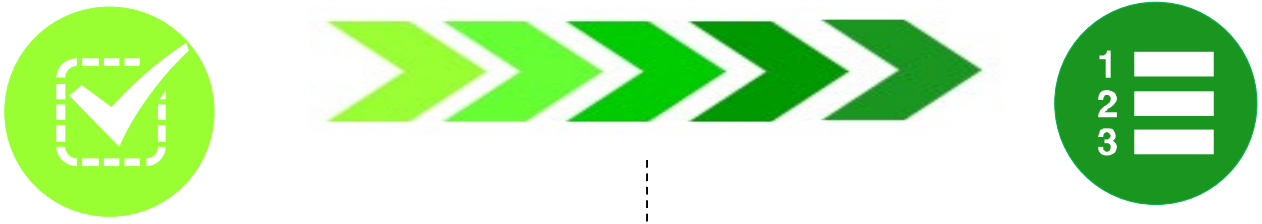
GREEN LOANS

SDG BONDS/LOANS

CLIMATE - LINKED MORTGAGES

SUSTAINABILITY-LINKED LOANS

Margin adjustment triggers



General ESG

Tied to 3P ESG rating

Pennon

gecina

abertis

Olam

Adecco

ACCOR HOTELS

wilmar

Specific metrics, stretch targets

Eg. emissions intensity reductions, percentage supply chain audits

IBERDROLA

renewi

storaenso

DSM
BRIGHT SCIENCE. BRIGHTER LIVING.

GRUPPO HERA

UNIBAIL-RODAMCO-WESTFIELD

Agri sector examples

Danonino	Dairy + plant-based products	€2b	ESG score Sustainalytics + Vigeo Eiris
BARRY CALLEBAUT	Cocoa & chocolate	€750m	ESG score Sustainalytics
storaenso	Pulp & Paper	€600m	Science-Based Targets per tonne pulp, paper board
bel	Dairy	€520m	Reduce carbon footprint, Foster healthier consumption habits and lifestyles, & Accelerate the sustainable transformation of dairy upstream. Penalty to a NGO or for internal investments allowing to achieve the objective.
Olam	Food processor / manufacturer	US$500m	ESG score Sustainalytics
wilmar	Tropical Oils, Oilseeds, Grains, Sugar	US$150m US$200m US$100m	Tiered adjustments based on Sustainalytics assessment of biodiversity and greenhouse gas reduction programmes, renewable energy use, freedom of association policy
SOCFIN Responsible tropical agriculture	Rubber & palm oil	€15m	Sustainability improvements

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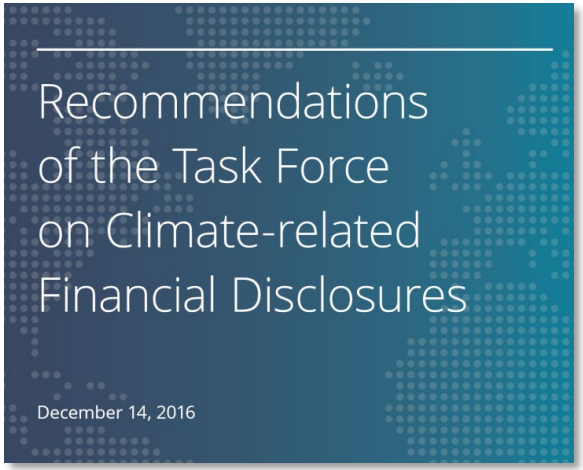
4. So…what does this mean?

Practical tips

Leading global guidance on climate-related financial risk assessment & disclosure: G20 FSB TCFD Report

- *What makes these voluntary standards so significant?*
- Governance, strategy, risk management, metrics & targets
- Specific additional 'supplemental guidance' for financial services + 12 non-financial sectors
- Stress-testing and scenario planning are central themes
- **Investors from BlackRock, ACSI and Climate Action 100+ seeking disclosure by investees consistent with TCFD Recommendations**
- Refer to Annex for sector-specific risk/opportunities guidance



Leading global guidance on climate-related financial risk assessment & disclosure: G20 FSB TCFD Report

4. Agriculture, Food, and Forest Products Group

The Agriculture, Food, and Forest Products Group includes, but is not limited to, industries listed in Figure 13.

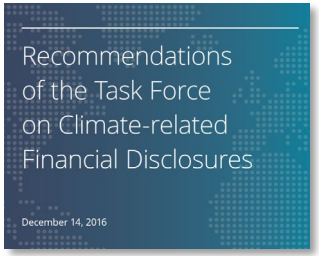
Climate-related risks and opportunities in this group largely emanate from GHG emissions and water and waste management driven by land use, production practices, and changing land-use patterns.[52]

The absolute and relative impacts of climate-related transition and physical risks will vary between producers and processors of food and fiber.

Producers, such as agriculture and forestry enterprises, will likely be impacted financially to a somewhat greater degree by GHG and water risks (including extreme weather

Figure 13

Agriculture, Food, and Forest Products Group



T PRODUCTS GROUP METRICS – ILLUSTRATIVE EXAMPLES

Financial Category	Climate-Related Category	Example Metric	Unit of Measure	Alignment	Rationale for Inclusion	Beverages	Agriculture	Packaged Foods and Meats	Paper and Forest Products
Revenues	Risk Adaptation & Mitigation	Revenues/savings from investments in low-carbon alternatives (e.g., R&D, equipment, products or services)	Local currency	CDP: CC3.2, 3.3, 6.1	New products and revenue streams from climate-related products and services and the return on investments of CapEx projects that create operational efficiencies.	■	■	■	■
Expenditures	Risk Adaptation & Mitigation	Expenditures (OpEx) for low-carbon/water alternatives (e.g., R&D, equipment, products, or services)	Local currency	GRI: G4-OG2 CDP: EU4.3	Expenditures for new technologies are needed to manage transition risk. The level of expenditures provides an indication of the level to which future earning capacity of core business might be affected.	■	■	■	■
Expenditures	Water	Total water withdrawn and total water consumed	Cubic meters	SASB: CN0101-06	Water stress can result in increased cost of supply, factual inability to produce, and/or legislation to regulate water withdrawal for production. The quantity of water consumed and percent withdrawn in high water-stress areas inform the risk of significant costs or limitations to production capacity.	■	■	■	■
Expenditures	Water	Percent of water withdrawn and consumed in regions with high or extremely high baseline water stress	Percentage	SASB: CN0101-06		■	■	■	
Assets	Water	Amount of assets committed in regions with high or extremely high baseline water stress	Number of assets, value, percentage of total assets	SASB: IF0101-06	Water stress can result in limitations to production capacity or enforced demolition of assets. The level of assets in high water-stress areas informs the potential implications on asset valuation.	■	■	■	■

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Physical risk: stress-testing & scenario planning over a plausible range of climate futures (not just base case or 'mediums') is key

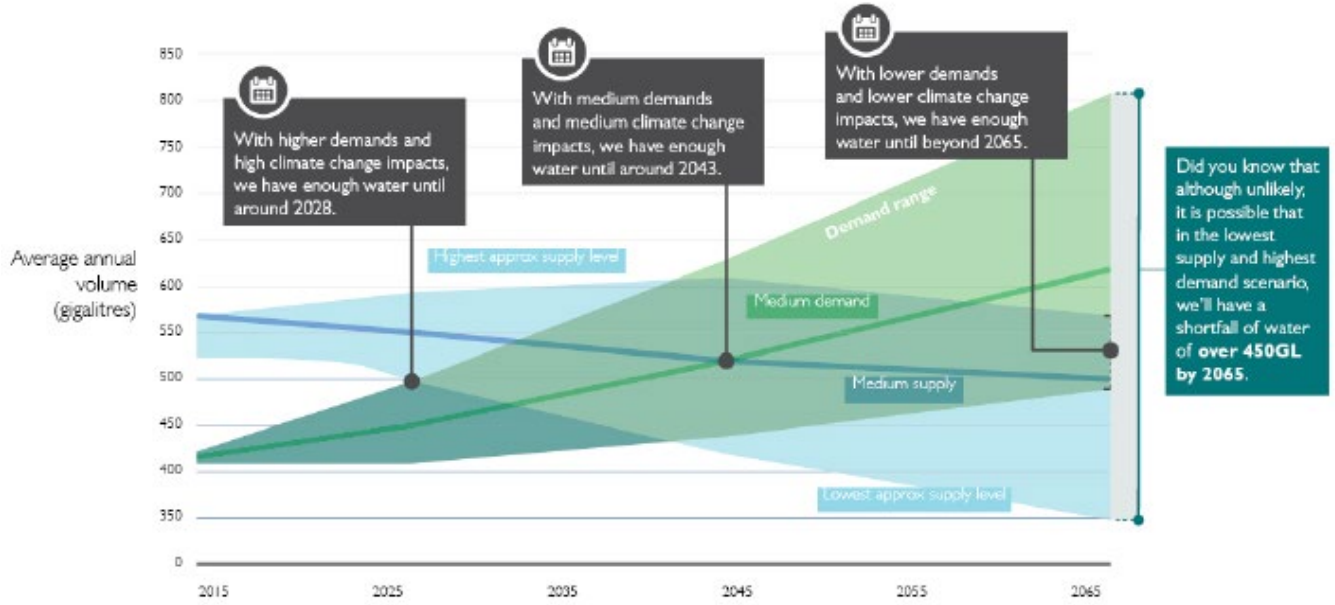

Figure 4: Long-term water supply and demand (Source: *Water for a future-thriving Melbourne*, 2017)

What does this mean for the business of food?

- The legal and financial imperatives for robust consideration is clear…but there are risks ***and opportunities***
- Minimising risks and capturing opportunities requires contemporary understanding, proactive inquiry and critical evaluation – forward-looking basis
- *How robust are scenarios and assumptions used in strategy and planning? How will the decisions we make now position us to continue to produce in this disruption?*
- A change from historical norms is inevitable (and has already happened). The variable will be 1.5°C vs 4°C+.
- *Planning based on historical norms instead of future scenario planning is a red flag.*

Contacts

Global Head of Climate Risk Governance

T +61 3 8608 2928
M +61 402 220 556

EMAIL
sarah.barker@minterellison.com

Partner, Banking & Agribusiness

T +61 2 9921 4739
M +61 412 489 012

EMAIL
matt.cunningham@minterellison.com

Partner, Sustainable Finance

T +61 7 3119 6196
M +61 418 722 272

EMAIL
keith.rovers@minterellison.com

Partner, Corporate & Agribusiness

T +61 7 3119 6455
M +61 421 617 096

EMAIL
ben.liu@minterellison.com

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