

# Business Continuity: Unlocking Green Performance From Airport Assets

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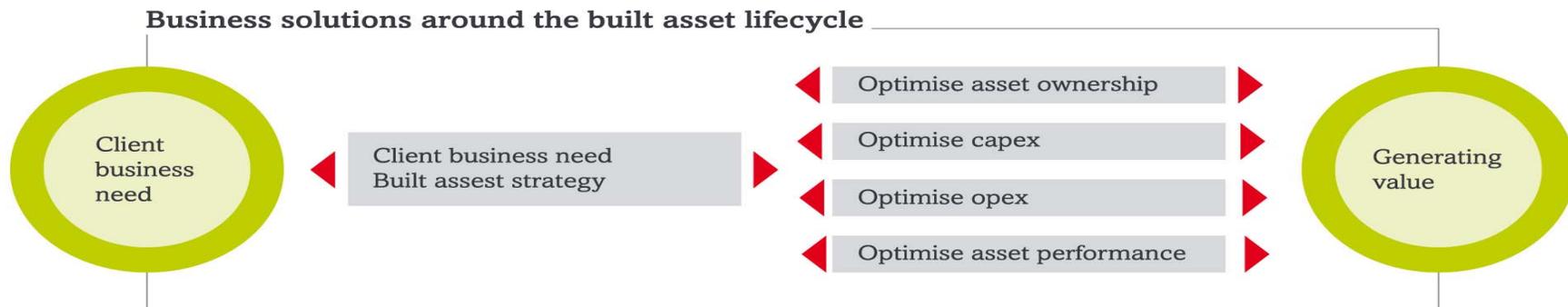
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Hong Kong Association of  
Risk Management and Safety

# Overview

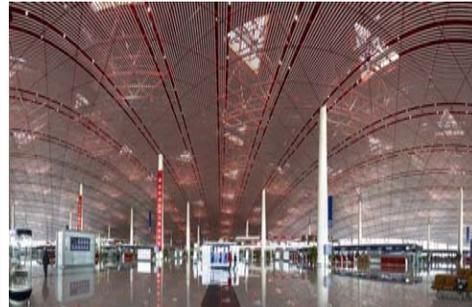


1	Setting The Scene	▶	High level 'fly through'
2	Aviation Industry Insight	▶	Unlocking Sustainable Asset Performance Through Operational Efficiency
3	Robust Risk Management	▶	Business Continuity Across the Development Cycle



*The Green Premium = Costs vs Value*

# What Is A Sustainable Built Asset .....



New Buildings	Existing Buildings
How sustainable? Certification?	Solid Walls
Location	Asbestos
Typology	Heritage + biodiversity
Massing	Poor thermal performance
Orientation	Appropriate innovation
Material choices	Site constraints
Energy systems	Space limitations
Renewable energy sourcing	Air tightness
Intelligent control systems	Existing infrastructure
Innovative technologies	Limited design flexibility
Flexibility in choices	Restricted choices

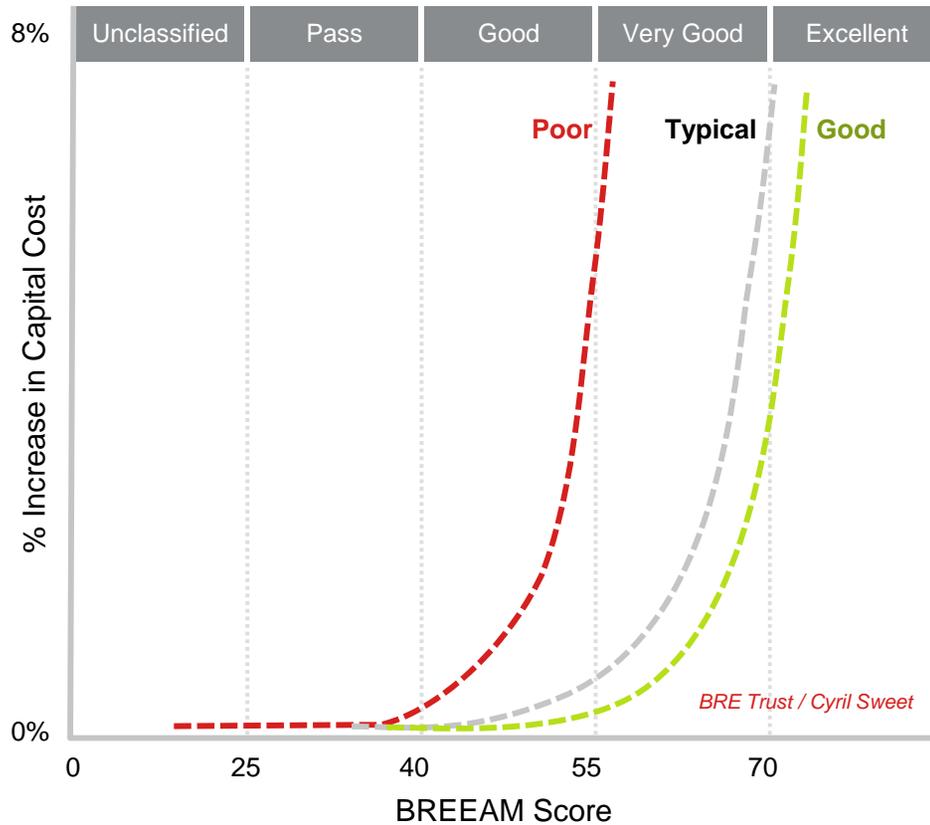


*Sustainable built assets embody environmentally responsible and resource efficient designs, systems + functions throughout their life-cycle*

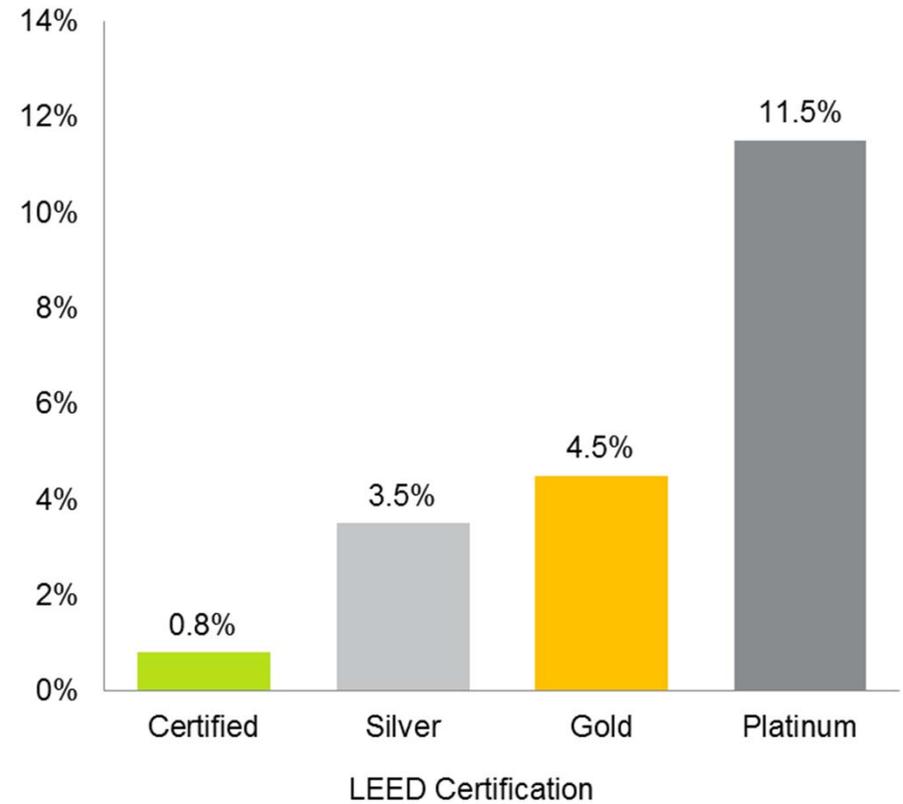
# Sustainability Costs More .....



## Putting a Price on Sustainability



## Cost Premium for LEED Buildings



*Innovation + Market Forces Driving Costs Down*

# Delivering Value



Legal Compliance + Financial	Business Assurance + Viability	Reputation + Brand Value
Building Regulations	Business Continuity	CSR
EPC + DEC's	Business Interruption	Differentiation
CRC	Future Proofing	Competitive Advantage
Corporate Reporting	Fuel Price Certainty	Recruitment + Retention
Planning Requirements	Climate Change	Productivity
Environmental Compliance	Market Value	Sickness Reduction
Renewable Energy Targets	'Licence to trade'	Value of the Brand



*Sustainability Acts As a Proxy for Risk, Operational Efficiency + Positive Cost Performance*

# 'Easy Wins' + Whole Life Cost Savings



## 'Easy Wins'

Project Type	Payback (yrs)
Lighting upgrades	3.3
Insulation (Loft, Cavity Wall, Roof, Double Glazing)	3.8
Lighting controls	3.2
Pipe work Insulation (Cooling, Heating)	2.7
Voltage optimisation	3.4
Heating (e.g. controls, zone control valves)	3.2
BEMS - remotely managed	3.2
Insulation - draught proofing	3.6
Boilers - control systems	3.3
Time switches	1.9
Heating – TRVs	3.2
Hot Water (Distribution improvements, point of use)	3.3
BEMS - bureau remotely managed	3.6
Ventilation (distribution, controls, air handling units)	2.4

## Whole Life Cost Savings

→ Based on a comparison of BREEAM buildings against building compliance standards (BRE Trust/Cyriel Sweet):

Naturally ventilated office:

- Energy savings of 17%
- Water savings of 71%

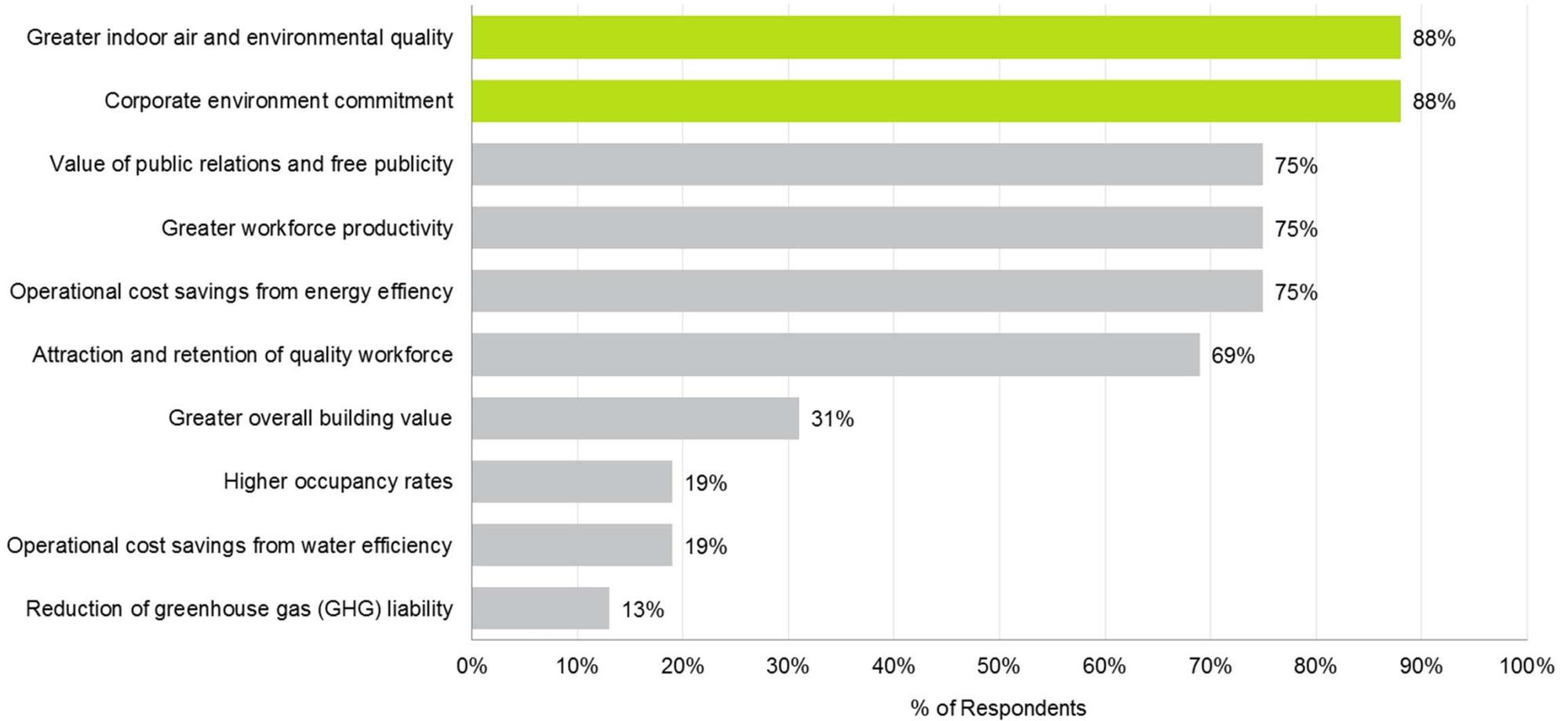
Air conditioned 'prestige' office:

- Energy savings of 26%
- Water savings of 55%



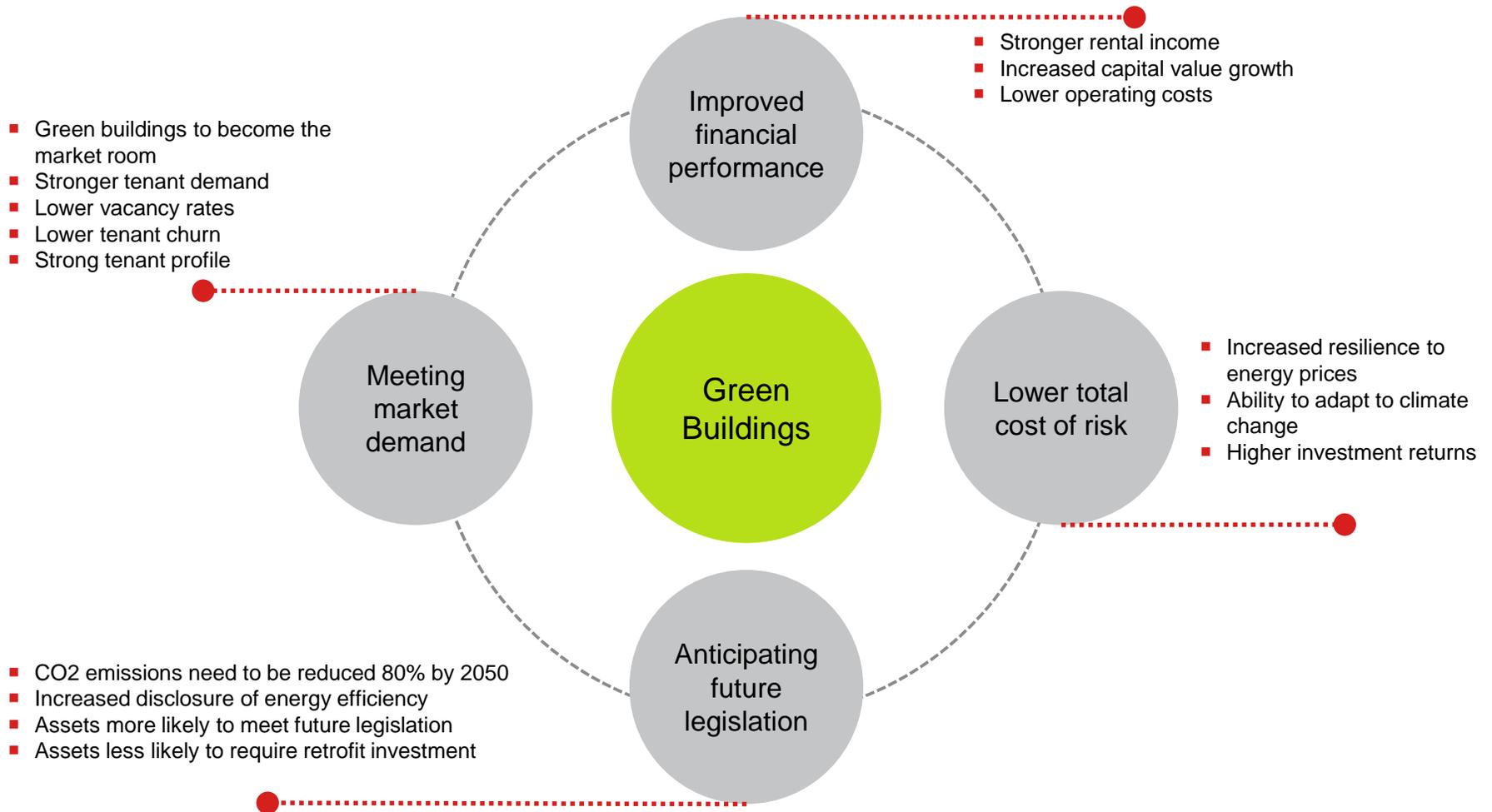
*Sometimes Less Delivers More – Always Look for the 'Easy Wins'*

# What Drives Green Development



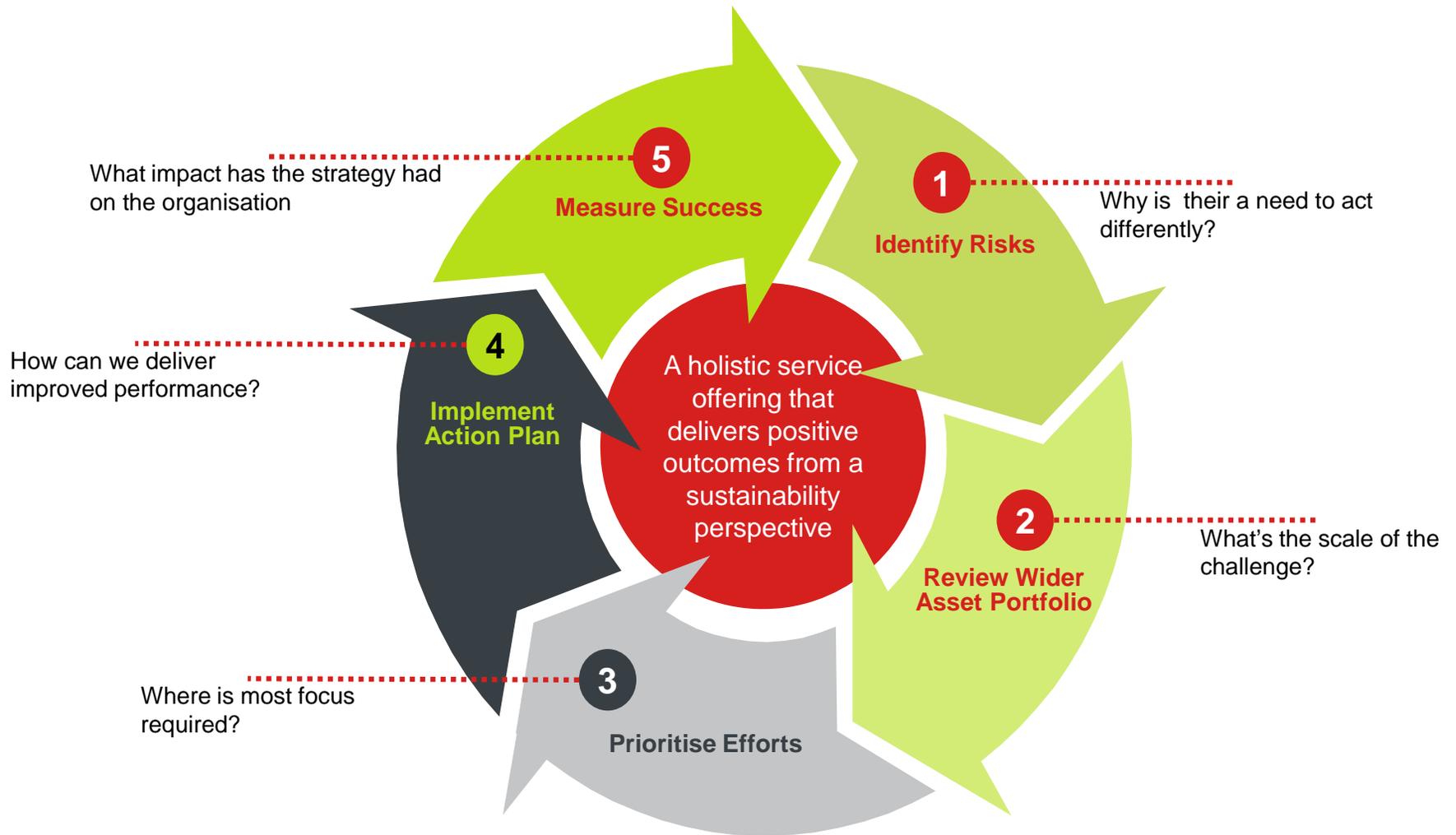
*The Market View*

# Sustainability Benefits



*Green Buildings deliver operational benefits + simply just stack-up.*

# Sustainable Asset Management Approach .....



*Embedding sustainability principles across design philosophy, built asset performance cycles + decision-making*

# Who Pays + Who Gains .....



Stakeholder Benefits						
	Investors	Developers	Designers	Contractors	Occupiers	
					Owners	Tenants
<b>Reduced Costs</b>	Capital costs	Maintenance costs and of capital costs, plus cheaper refits and faster lets	Design time and snagging	Resource use and waste on site	Maintenance & operational costs and downtime in using building	Maintenance & operational costs and downtime in using building
<b>Reduced Risks</b>	Reduced risk on capital	Letting voids	Quicker planning permission	H&S, pollution liabilities and time savings, no over run penalties	Asset value risks and H&S liabilities	H&S liabilities and flexible accommodation for future subletting
<b>Higher Returns</b>	Faster return of capital	Increasing net lettable area and higher rents and occupier retention		Repeat work due to satisfied clients	Improved staff productivity	Improved staff productivity
<b>Satisfaction</b>		Personal satisfaction / intellectual challenge	Personal satisfaction / intellectual challenge	Personal satisfaction / intellectual challenge	Improved staff satisfaction / retention	Improved staff satisfaction / retention
<b>Image</b>	Demonstrable performance for SRI FTSE4 good eligibility	Profile & distinctive buildings on market	Repeat work due to satisfied clients	Improved image to clients and improved public image	Improved image to clients and improved public image	
<b>Experience Gained</b>		Future marketability	Future marketability	Future marketability		
<b>Business Flexibility</b>	Flexibility of investment potential	Flexibility of letting / sale potential	Flexibility of building use	Flexibility of building use		



*In reality, how do we make this work .....*

# Unlocking System Efficiency In Dynamic Operating Environments



## Significantly Reduce Aircraft Delay, Fuel Burn + Emissions

- Target performance improvements in ground operations:
  - 10-15% reduction in outbound taxi time + fuel-burn for each aircraft departure
  - 5% reduction in inbound taxi time + fuel burn for each aircraft arrival
  - No increase in stand delay times for aircraft departures / arrivals



## Average 2 minute reduction in taxi time per ground movement

- Target overall improvements in punctuality and operational consistency:
  - Optimise sequencing for inbound / outbound aircraft
  - Reduce queuing at RHAs + apron entry / exit points
  - Eliminate airfield 'bottlenecks' + high aircraft loading in key manoeuvring areas
  - Tighter 'block-time' distributions



*Innovation is the driving force behind providing the right solutions to shape aviation's sustainable future.*



Airport Capacity and Carbon Efficiency

# Using Innovative Approaches .....

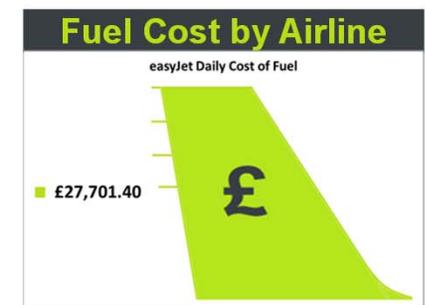
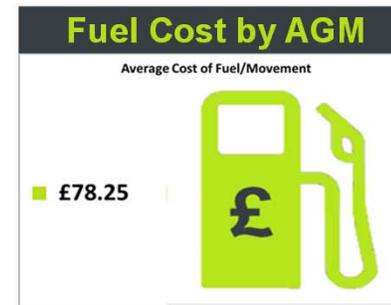
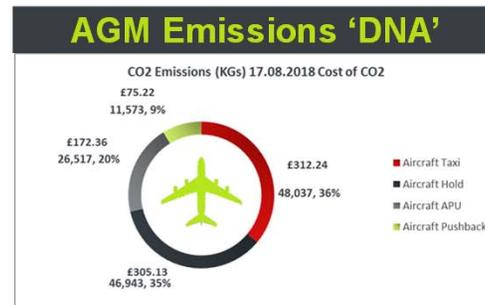
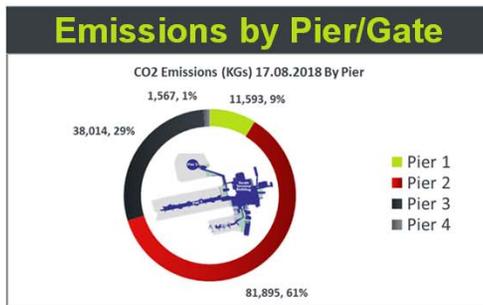
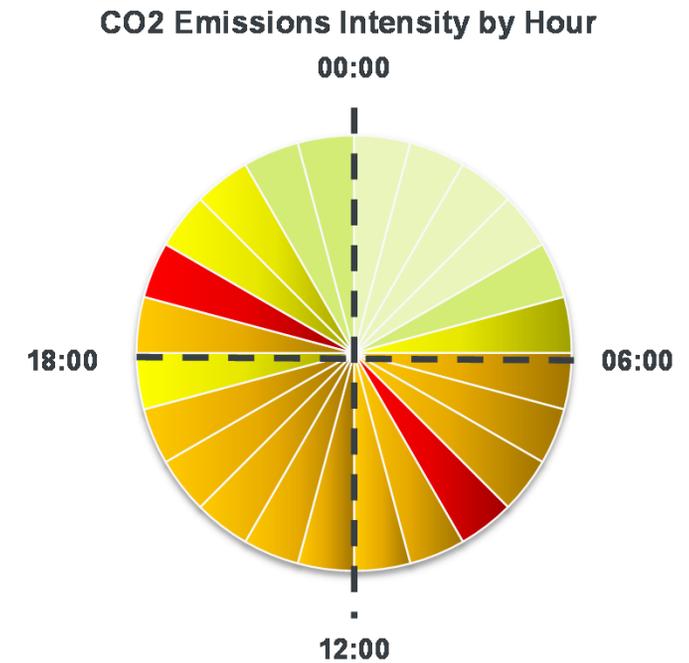
- AC²E is an analytical, rule-based tool used to **accurately estimate + quantify fuel burn + CO<sub>2</sub> emissions** for aircraft operations in the LTO Cycle (i.e. up to FL030).
- Through simulating actual traffic schedules in fast-time, the **detailed movement history + actual operational interactions**, including pushback times, APU use, taxi distances + holds, can be established for each aircraft movement in the schedule.
- Individual aircraft fuel burn + CO<sub>2</sub> emissions performance **“DNA”** is then calculated, taking account of actual or representative **time-in-mode, aircraft engine + APU types**.
- **Carbon ‘hot-spots’** can be identified + **solutions to improve efficiency** formulated + tested using a scenario based approach in AC²E + deep operational insight.



*Combining innovative techniques in computer-aided modelling + operational performance to drive accurate analysis.*

# Key Strengths .....

- A key strength of AC²E is the granularity of data used for the build-up of **airfield infrastructure, operational procedures, delay, fleet mix, aircraft speed profiles, engine thrust settings + ATC procedures**
- Full examination of every system element with a high level of precision.
- **Pin-pointing of “system stressors/delay bottlenecks”** – taxi route network, infrastructure use, slot coordination and airfield capacity, ATC procedures and/or airline schedules.
- Below FL030 **CO<sub>2</sub> emissions** are based on certified engine fuel flow rates from **ICAO’s Aircraft Engine Emissions Databank**.



*Provides a powerful evidence base to justify future capital investment + business plans, to support ACA certification + to strengthen CSR programmes.*

# Methodology Overview

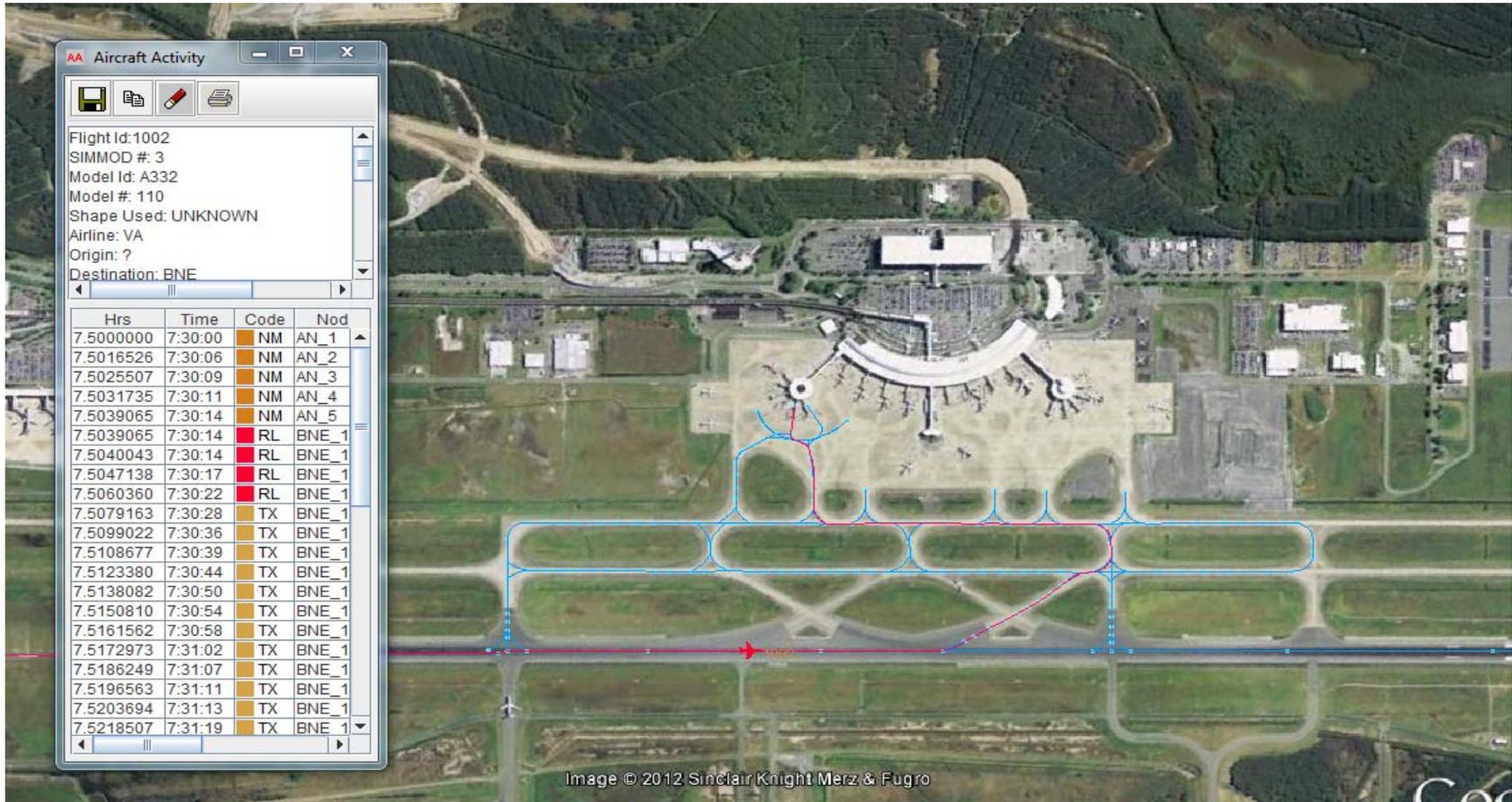


“AC²E = Precision + Accuracy in the calculation/assessment/reporting of fuel burn, CO<sub>2</sub> emissions and cost performance.”



*Robust, systematic steps in a coherent framework from which to quantify aircraft fuel burn, GHG emissions + cost performance.*

# Using Fast-Time Simulation + SOPs For Precision Analysis



*Profiling the 'DNA' of every flight phase in the LTO Cycle to pinpoint system 'stressors' + identify solutions to enhance performance.*

# Adding Value .....



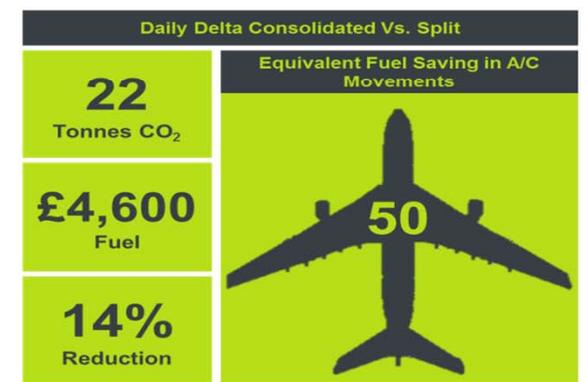
## Key Drivers Behind Improved CO<sub>2</sub> Emission + Fuel Burn Performance

- ➔ **Consolidation of daily operations** into single terminal, moving closer to the predominant runway end (75:25 split).
- ➔ **RET** procedures operated by all aircraft arrivals and departures.
- ➔ **400Hz FGEP systems** installed at all stands to replace the use of aircraft APUs during flight turnarounds.
- ➔ **Elimination of airfield conflicts** on taxiways at various points on the airfield, particularly holds between inbound/outbound traffic.
- ➔ **Streamline inbound taxiway routings** to reduce and avoid the number of major delay points encountered by Split Operations.

## Potential CO<sub>2</sub> Emissions + Fuel Burn Savings

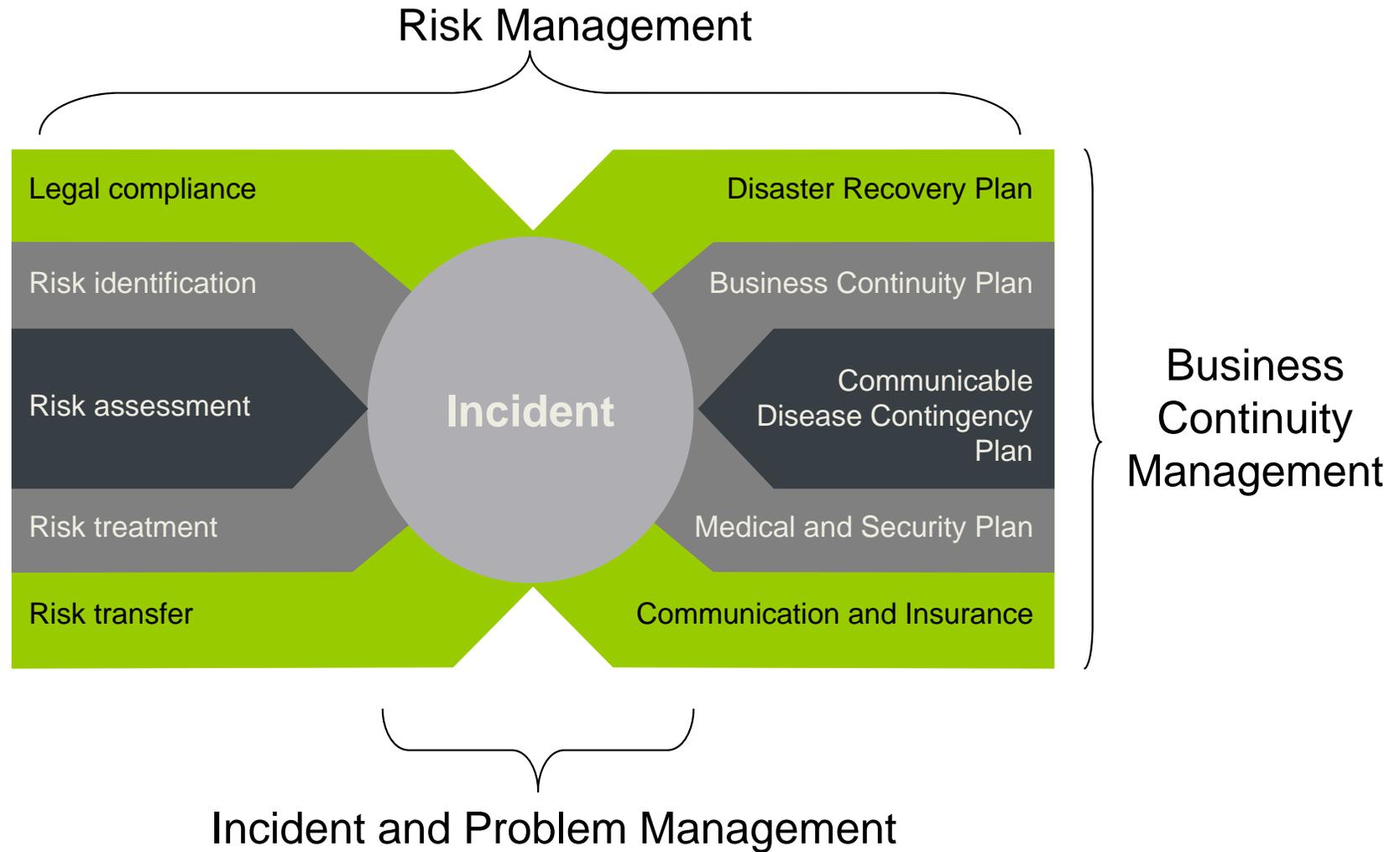
**Aircraft Taxi Cost Saving**  
**5%**

**Aircraft Hold Cost Saving**  
**29%**



*Driving 'SMART' business decisions which deliver 'REAL' value to shareholders, the community + the 'Environment'.*

# Assurance Stages



Business continuity management should be integrated with risk and incident management system

# Business Continuity Planning

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- Defining business-as-usual requirement, critical operations and facilities
- Business Impact Analysis along supply chain
- Short term and long term considerations
- Integration with risk and incident management system
- Scenario development and planning
- Develop testing criteria, mode, scale and required resources
- Independent observations for gaps and improvement
- Debrief covering observations, recommendations, improvements and update on Business Continuity Plan



# Business Impact Analysis

People



Brand



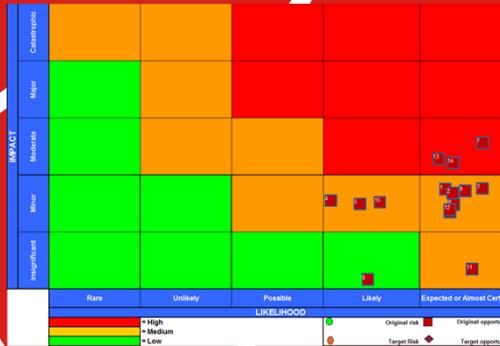
Internal Resource

External Resource

Environment



Business + Finance



Sustainability should be considered in business continuity management



Any Questions .....

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*Open + interactive discussion driving knowledge share.*

# Key Contacts



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*Enhanced environmental performance translates into improved operational efficiency, direct 'bottom-line' savings & sustainably driven outcomes.*

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