

NDBI

Non-Damage
Business Interruption
and Delay in Start-up

IMIA Working Group 125(21)

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Agenda

- I. Introduction
- II. From BI to CBI to **NDBI**
- III. (Attempt of) Definition of **NDBI**
- IV. NDBI Triggers**
- V. NDBI Consequences**
- VI. Insurability & Risk transfer
- VII. Conclusion

Objective of today

- Raising awareness on potential NDBI-Scenarios in a Globalized World
- Discuss main NDBI-Scenarios
- Foster comprehensive understanding on the NDBI-subject in context of E&C

Not In Scope: Ready-to-use Product

I. Introduction - 'Global Risk Map'



Awareness of Traditional and implicitly "Non-Traditional BI" (i.e. PD-BI and NDBI)



I. Introduction

Headlines covering NDBI since some time

General

- **“The missing piece of your business interruption”**
Corporate Risk and Insurance 2018
- **“Non-damage business interruption risk: A creative approach required”**
WillisTower Watson Nov 19, 2019
- **“Today’s complex world of business interruption”**
MunichRe 2016
- **“Unlocking the mystery of Non-Damage-Business-Interruption”**
SwissRe Corso, 23 June 2020
- **"AON seeks to cover the intangible with parametric NDBI"**
ARTEMIS 20th November 2018
- **"BI Insurance claims: what happens next?" -**
Womble Bond Dickinson Jan28, 2021

More specifically related to COVID19

- **“EIOPA calls for capital markets capacity for pandemic NDBI insurance”**
ARTEMIS 12th February 2021

More specifically related to Terror

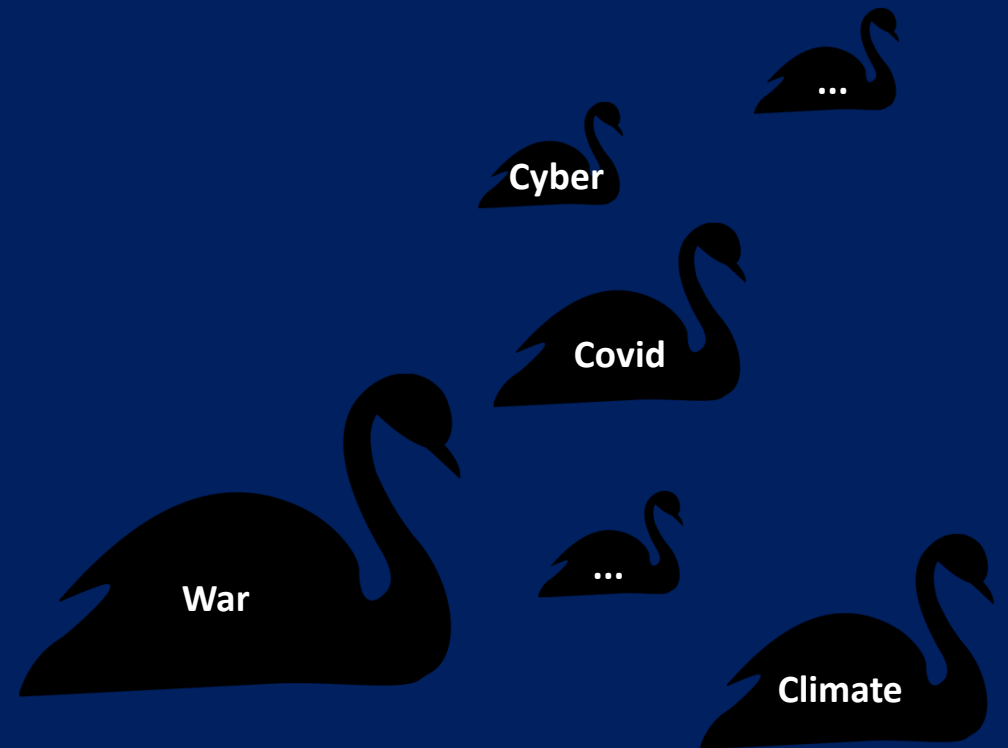
- **“Non-Damage Business Interruption (NDBI) cover is the most significant development for businesses since the inclusion of CBRN cover”**
PoolRe

Since 2003 Pool Re Terrorism Cover has included ‘damage’ caused by an Act of Terrorism that involves the use of chemical, biological, radiological or nuclear means (CBRN).

Black swan's coming in swarms...

Turning Point in History ?

Do you know ENID's ?





I. Introduction

Growing importance of non-traditional Scenarios requires sound risk-management

- ❑ **“Non-traditional” scenarios are becoming more and more attention**

Pandemic just one of many

- ❑ **Risk-evaluation must not stop at industries gates**

There is more than FLEXA

- ❑ **Holistic risk-management process creates awareness**

Risk-Managers recommended to include NDBI-Scenarios

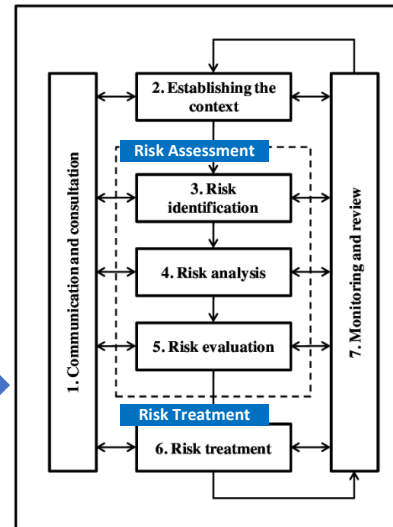
Risk Assessment

- Risk Identification
- Risk Analysis
- Risk Evaluation

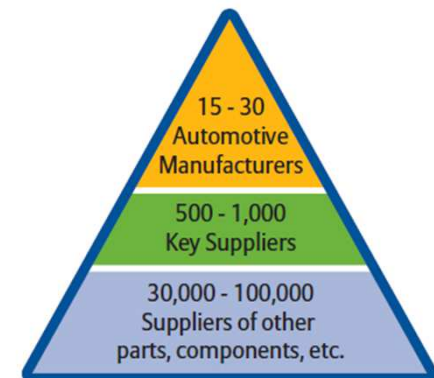
Risk Treatment

- Avoiding
- Accepting or increasing
- Removing the risk source
- Sharing the risk
- Retaining the risk
-

ISO 31000 Risk Management Standards



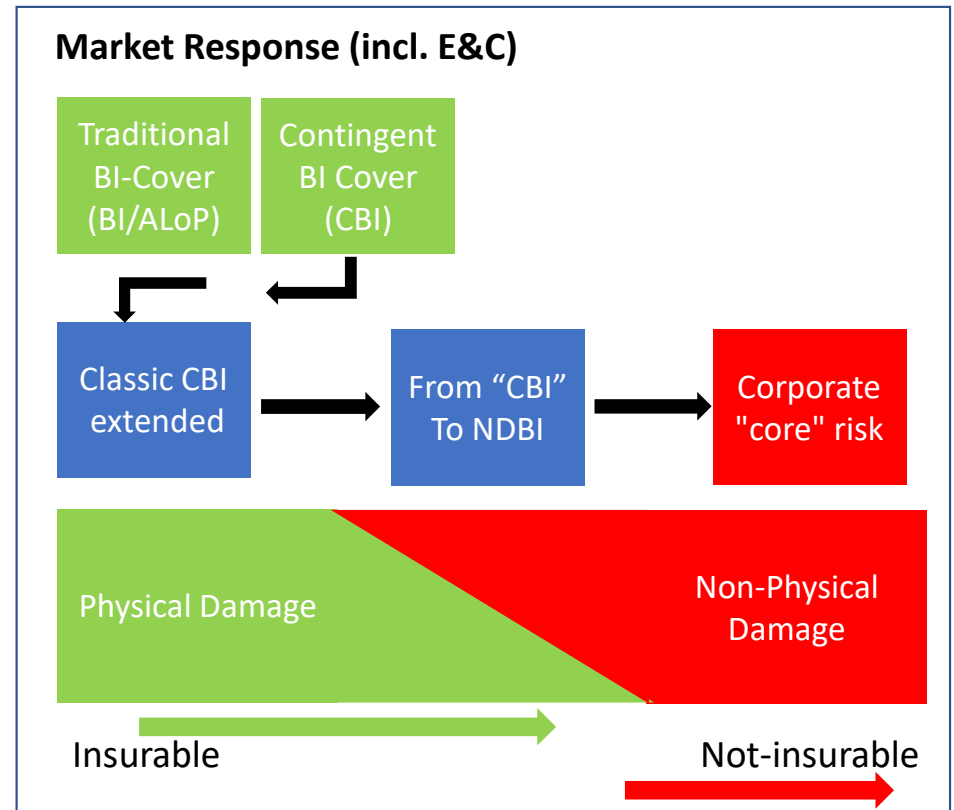
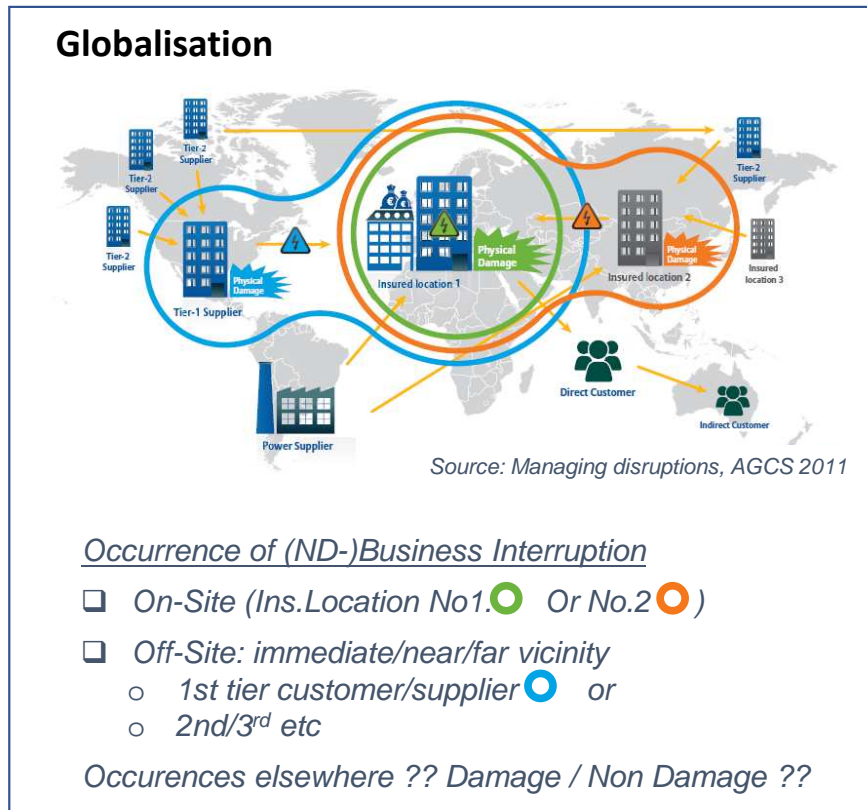
Automotive Supply Chains



Source: Munich Re

II. From BI to CBI to NDBI

Globalised Exposure: Likelihood and Severity are increasing



Based on:
 ❑ SwissRe – NDBI-Webinar 2016;
 ❑ AGCS Extended CBI 2014



II. From BI to CBI to NDBI = f(Occurrences)

Exposure: What Insurer/Insureds actually understand as NDBI; always "ND..." ?

Location of "Occurrence" Scope of Cover = f (individ. (C)BI-Policy)	Phys. Damage F (Perils Insured)	Other Occurences (No-PD) Insurability may be limited
Insured's Site	BI	NDBI
Insured's Site Vicinity	(C)BI	NDBI
Site of Direct Trade Partner <small>(1st tier) - goods and/or energy, telcon, IT-provider,..</small>	CBI !	NDBI
Site of Indirect Trade Partner <small>(2nd tier, 3rd tier etc.)</small>	CBI ?? ↔ ?? NDBI	NDBI
Elsewhere far way / globally <small>(e.g. Canal blockage; Flight cancellation due to bushfire, vulcano)</small>	?? CBI becomes NDBI ??	NDBI
"Untrue" NDBI		"True" NDBI



II. From BI to CBI to NDBI - 'Basic' Loss Scenarios

BI/Alop Loss plus Extra Costs

Non-Damage Occurrence

☐ ND-BI due to

- Interruption of production
- No/less usage/availability
 - (e.g. Toll-roads, MRT, Hired Plant/Equipm...)
- Extended repair period
 - Lack of personnel (quarantine), spare parts, permits,...

☐ ND-AloP due to

- Prolongation of Construction Period
 - Market-entry delayed
 - Demand changes
"Market risk"; e.g.: missing the season - ski/ golf/holiday-resort, fireworks and / or economic downturn)
 - Competition increased (others might catch up)
-

	Root cause 'Infectious Disease'	
	Physical Damage	No Physical Damage
Increased Cost of Repair	maybe	∅
	Dimensions of NDBI	
Increased Time of Interruption/Delay	maybe	yes

☐ Both = Extra-cost ("BI" ?)

- Higher Cost due to Scarcity
 - spare-parts (supply chain interruption)
 - workers --> plus higher wages&salaries
- Add. Cost
 - Interest (Longer Financing), Remarketing
 - Inflation: increased costs for unbuilt portion
 - Longer insurance = higher premium
 -



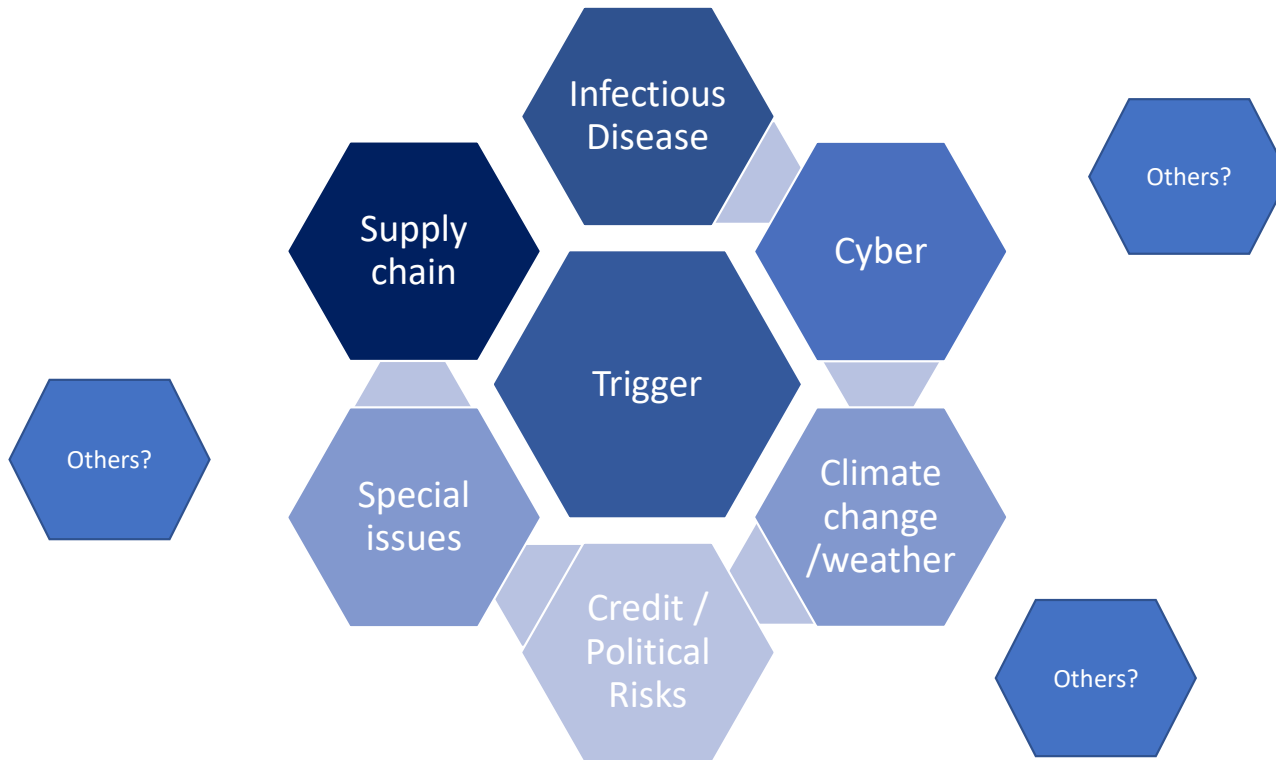
III. NDBI – Attempt of a DEFINITION

No <u>Direct</u> Physical Damage	Occurrence Definition (Insurability)	Affected Parties	Causation
<ul style="list-style-type: none"> ❑ <u>Traditional</u> BI Trigger = Physical loss ❑ Physical loss = f (Jurisdiction) ❑ Extensions to different extent =f(market) "(extended) CBI" 	<ul style="list-style-type: none"> ❑ Occurrence = manifestation of a defined peril, identifiable & precisely described; fear or risk of loss only may not suffice ❑ Occurrence = f (jurisdiction) ❑ Insurability = f (accidental and/or fortuitous occurrence). 	<ul style="list-style-type: none"> ❑ NDBI cover generally procured by the owner or leaseholder of the Insured property ❑ Engineering specific: DSU / ALOP ❑ Insured Interest to be specified ❑ E&C : <ul style="list-style-type: none"> ○ Owner /Operator / Investor / Developer ○ (Sub-)Contractor / Supplier 	<ul style="list-style-type: none"> ❑ (1) Defined Peril appears (2) causing an occurrence to happen (3) causing a NDBI (AloP)-loss <p><i>'How would insured business have performed but for, or in the absence of the occurrence?'</i></p>
<ul style="list-style-type: none"> ❑ NDBI = f (no direct physical damage) 	<ul style="list-style-type: none"> ❑ NDBI = f (defined occurrence) 	<ul style="list-style-type: none"> ❑ NDBI = f (Insured Party) Policyholder (one) specified 	<ul style="list-style-type: none"> ❑ NDBI = Principle of 'Immediate Cause' (1+2+3 --> indemnity)
<p><u>NDBI-Examples</u></p> <ul style="list-style-type: none"> ○ COVID – no PD ○ Strike – no PD ○ Cyber ○ Evergiven Suezch. – no PD ?? ○ Flood in e.g. Thail. – PD !! 	<p>NDBI-AllRisk = not feasible</p> <p>UW'ers / Actuaries need 'scenarios' to evaluate & assume risk</p> <p>➔ "ENID-Challenge"</p>		

IV. NDBI TRIGGERS in a VUCA* World



* VUCA:
volatile, uncertain, complex, ambiguous



Root causes for NDBI - Scenarios in reality are manifold and individual.

?? Is that all ??



IV. NDBI TRIGGERS – Infectious Disease



- ❑ **COVID19**
 - One of most discussed cases of a NDBI Exposure for E&C Insurance
 - Outbreak negatively affected many contractual relationships and business models
- ❑ **'Infectious Disease' in its literal sense** embraces **much more than just COVID19**
(now think about monkeypox virus)

<i>Pandemic</i>	<i>Epidemic</i>	<i>Notifiable</i>	<i>Other</i>
<i>Spreading over countries and continents (e. g. classified by WHO⁹ as such)</i>	<i>Rather affecting local population only</i>	<i>mandatorily to be notified to local authorities</i>	<i>"infectious" diseases</i>
Low	↔	Insurability	↔
High			

- ❑ **Consequences of 'Infectious Diseases'** may have many facets and can reach from «just» higher cost of repair and no time-delay to stand-still or delayed completion or loss of BI or even marketshare.
- ❑ **Communicable Disease Exclusions / Endorsements** discussed embrace
 - **From: Complete exclusion** of any BI (delay/interruption) situation parallel to an Infectious Disease
 - e.g.: "... directly or indirectly caused by, contributed to by, resulting from, arising out of, or in connection with a Communicable Disease or the fear or threat (whether actual or perceived)..."
 - **To: Write-Back** of delay/interruption **caused by physical damages** (named perils/all-Risk)
 - e.g.: "...this exclusion does not apply to any covered loss, damage,directly caused by, ... physical damage to property insured...."



INFECTIOUS DISEASE

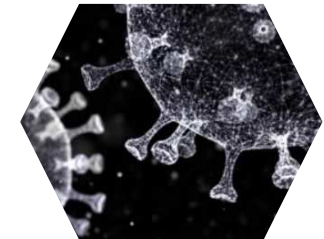
Accumulation Exp.

- Pandemic = High
- Notifiable = Low

IV. NDBI TRIGGERS – Infectious Disease



- Lockdown of Site "immediately" affected** due to
 - Actual Infections on Site (Workers infected)
 - Lockdown enforcement in area (Local Authorities ordering Lockdown)
 - Employer's caring for health-security and "precautionary" closing site
- Lockdown of Site "remotely" affected** due to
 - lack of supply (spare-parts, goods, energy, telcon, data,..) caused by lockdown somewhere in own country / other countries (risk of globalisation)
- Quarantine**
 - extended (repair) works periods as workers are obliged to follow quarantine rules (permits)



INFECTIOUS DISEASE

EXAMPLES

Infectious Disease – "Risk categories"

Pandemic	Epidemic	Notifiable	Other
Spreading over countries and continents (e. g. classified by WHO ⁹ as such)	Rather affecting local population only	mandatorily to be notified to local authorities	"infectious" diseases
Low	↔	Insurability	↔
			High

"Infectious Disease" Categories ordered by impact to society / "seriousness"

There is even more health issues (infectious?):

- Food poisoning on large remote sites with own catering
- Water in-toxination
-

IV. NDBI TRIGGERS – Cyber

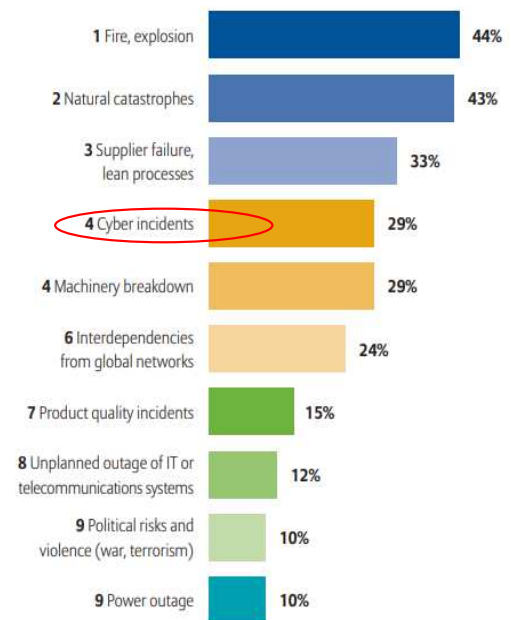


❑ Cyber

- Exposures in the context of IT-Risks
- Cybercrime/-war, IT failures, data breaches, technical glitch, human error,...

❑ Cyber incident may

- cause interruption of supply-chains
- stop (just-in-time) production
- delay construction (BIM*)
- Compromise quality (mixture, temperature,...)
- even lead to a «Black Out» event.
- be limited: one site (Construction; Steel, Cement; HPP;...)
- be widespread: Power Grid; Cloud Service



Source: Allianz Global Corporate & Specialty.



CYBER

Accumulation Exp.
○ Low to very High

*BIM – Building Information Management

IV. NDBI TRIGGERS – Cyber

☐ CYBER ATTACK TO A POWER GRID

NDBI: due to lack of power

Scenario studied extensively by governments and financ. regulation authorities in recent years

- for power-producers
- for power consumers (incl. e.g. construction site,)
-

☐ DISTRIBUTED DENIAL OF SERVICE ATTACK (DDoS*)

NDBI: due to non-functionality of IT-Hard/Software

- Disruption supply chain logistics – operation and construction
- Disruption of Construction: BIM**
- ...

☐ RANSOMWARE ...blocking data until ransom is paid

NDBI: due to lack of access to data

- Disruption of Construction: BIM**
- Disruption of Operation: Lack of control system; CNC Programs;
- ...

Standstill ==> NDBI&more

- Groundwater-pumps on construction sites
- Failure of Control e.g. melting-furnaces / extruder etc. --> Cooling /Freezing
- Standstill of big/heavy rotors may cause damage
- Standstill of transport (railroad; ...)
- Interference with harbour logistics causing stoppage of bridge-construction due to lack of prefabricated elements
-



CYBER

EXAMPLES

← Cyber-Attack executed by individuals or part of modern warfare to de-stabilise →

* Distributed denial of service Attack

IV. NDBI TRIGGERS – Climate Change / Weather



- ❑ **Global warming** becoming an indisputable fact
- ❑ **More frequent / severe cat-events**
 - With PD and BI and NDBI effects, i.e. from actual damage to supply-chain (commodities, prefabrication, spare-parts, demand,..)
- ❑ **Local Weather may cause NDBI**
 - In the immediate affected area
 - In the wider area nationally and internationally (interruption of supply chain)

"Classic" NDBI-Products = Parametric Insurance in E&C .. and elsewhere

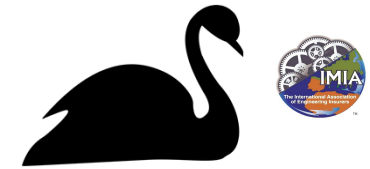
Renewables	Construction Sites	Infrastructure	Manufacturing Industry
<ul style="list-style-type: none"> • Lack of wind (speed) • Lack of sun (Photovoltaic / Concentrated Solar Power) • Lack of water • 	<ul style="list-style-type: none"> • Winter interruption → heavy storm, rain, snow, frost etc • 	<ul style="list-style-type: none"> • Bridges – too heavy winds prohibit use; • Tunnel – too much snow at Access Road, risk of avalanches • River – too low water level for shipping etc 	<ul style="list-style-type: none"> • Workers and/or material availability (supply) and/or production process might be prohibited by bad weather conditons



CLIMATE CHANGE WEATHER

Accumulation Exp.
○ Low to very High

IV. NDBI TRIGGERS – Climate Change / Weather



❑ Lack of rain (drought)

Restrictions on the transport of goods (e. g. Rhine)
e.g.: supply/delivery of coal for power plants, other heavy-duty goods
like steel/cement, cars for export, lack of water in reservoirs (HPP:Power
outage) ,....

❑ Raising average temperatures and heatwaves

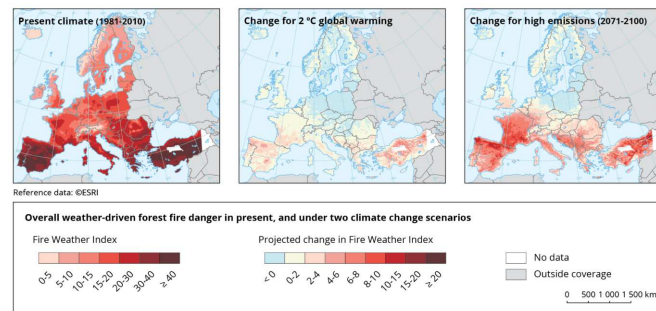
Riverwater too hot for cooling Nuclear power plants
--> limited/decreased capacity

❑ Wildfires in Europe / Queensland Floods / Pakistan

Interruption of supply chains



(Source: www.swr.de/swraktuell/rheinland-pfalz/prognose-niedrigwasser-rhein-2022-100.html)



(Source: www.eea.europa.eu/ms/forest-fires-in-Europe)



CLIMATE CHANGE
WEATHER

EXAMPLES

IV. NDBI TRIGGERS – Political & Credit Risks



❑ War / Civil War (armoured conflict) / 'unstable' governments

- Inside country:
 - Interruption of Power/IT/supply chains without PD-loss (NDBI)
 - Compromised Security; e.g.: forced to leave e.g. construction sites (Angola/DemRep.Angola)
- Outside country:
 - 'just in time'-delivery suffers NDBI plus min. higher costs

❑ Trade wars (unarmoured conflict) / Sanctions / Expropriation

- "Unforeseen" Trade embargo (e.g. example Russia/Ukraine/Belarus) of companies/individuals
 - 'just in time'-delivery suffers NDBI (e.g. Gas, Oil, Wood,..., Supply Chain, Financial services)
 - PLUS Higher Costs

Both above: induced inflation changes demand → business-models becoming obsolete

- Insolvency of e.g. construction ("Lifetime NDBI")

❑ Change in law

- e.g. Strategy-change of governments; (new) authorities may withdraw permits, licenses or may pose new requirements/taxes causing business-model becoming less attractive expropriation

❑ Environmental – Aspects (ESG)

- Operation licenses (earlier) withdrawn (e.g. Germany NPP; CPP)
 - E.g. Exit of Coal PP 2038 → 2030; Exit of NPP 31.12.2022
 - Arctic Oil / Tarsands



**POLITICAL & CREDIT
RISKS**

Accumulation Exp.
○ Low to very High

IV. NDBI TRIGGERS – Political & Credit Risks



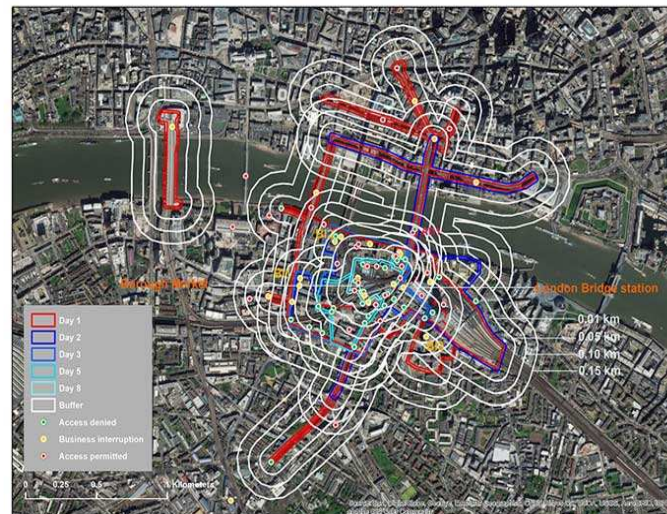
NDBI - Showcase:

Borough Market Terror Attack 2017 (London)

Following the actual attack “Zones” of limited accessibility were established by authorities

Zones decreasing from Day 1 → Day 5

- Businesses must stop in these Zones though in most zones no damage occurred (incl. e.g. construction sites)
- Employees/Workers must stay away; Customers may even much longer avoid visiting the Zones (NDBI - loss of attractivity)



Affected Areas- Day 1-5
(Source <https://ihsmarkit.com/research-analysis/nondamage-business-interruption.html>)



POLITICAL &
CREDIT RISKS

EXAMPLE

IV. NDBI TRIGGERS – Special Issues



DISCOVERY OF

- Unexpected (soil) pollution**
- Archaeological remains**
 - Rome (Italy) – Metro
 - Cairo (Egypt) – Metro
 - Beijing (China) – Olympic games stadium
- Protected species**
 - Protected riffs (Fehmarnbelt tunnel works)
 - Seals, Wales during construction of Wind-Offshore
- Weapons of war**
 - Unexpected confrontation with WWII remainders



SPECIAL ISSUES

EXAMPLE

Accumulation Exp.

○ Low

IV. NDBI CONSEQUENCES (All Triggers)

Conclusion - Sample Effects on e. g. Construction Sites



☐ (NDBI) Interruption/Lockdown due to

- Quarantine (at site or elsewhere)
- Interruption of Supply-Chains
- Lack of Systems/Data (Cyber)
- Climate/Cyber/Demand related lim. "accessibility" or "usage"
- Compromised Security
- Political / Ecological Scenarios

➔ NDBI

= BI / ALoP / Extended Repair Period

PLUS

➔ Higher Cost

Note:

Supply Chain Interruption = more than BI/ALoP

➔ Increase of CAR/EAR-Risk ("PD") as well

- More/earlier supply of material and stock on site
- Unattended site (Theft/Arson/.../Quality/...)

NDBI - Impact Levels	Immediate	Mid-/Long-term
Financial Loss		
Legal or contractual liability to third-Party		
Fail to meet fin.obligation		
Reputational loss		
Loss of company's values		





VI. INSURABILITY / RISK TRANSFER

The ENID*-Challenge

* ENID – Event not in Datasets

Loss driven	Pure Risk vs Speculative Risk	<ul style="list-style-type: none">• No positive outcome on pure risks• Speculative risks have a chance of producing a profit or producing a loss (not insurable)
Hazardous	Due to Chance	<ul style="list-style-type: none">• Insurable risks need to be uncertain, unforeseen• «Bad luck» - random and fortuitous
Measurable	Definiteness and Measurability	<ul style="list-style-type: none">• Proof of loss• Measurable, identifiable or calculable
Frequency and severity statistics	Statistically Predictable	<ul style="list-style-type: none">• Loss experience basis• Exposure basis
Non-systemic and not too large	Non Catastrophic	<ul style="list-style-type: none">• Insurer cannot cover risks that are affecting everyone at the same time or events that are in magnitude exceeding existing capacities
Well spread	Randomly Selected and Large Loss Exposure	<ul style="list-style-type: none">• Wide range of different insured / population• Reasonable frequency
Understood financial impact	The Bottom Line	<ul style="list-style-type: none">• Risk must relate to an economic loss• Risk needs to be correctly explained and understood

Appendix - Sample products



- WGP carried out desk-research looking for readily available NDBI-Products with relatively modest result for E&C market only.
- However, not limited to the E&C Market and looking into the wider ART-market, it can be assumed that various re/insurance companies offer various bespoke solutions ("balance-sheet protection")
- Accumulation issues (e.g.: Pandemic, Cyber, Terror,..) may require governmental backed-up solutions

(Re-)Insurers

- Weather related Parametric Solutions
- Multi-Year Performance Guarantees (PV/Wind On/Offshore)
- Cyber-related Products
- Epidemic Solution
- Dedicated NDBI cover for terrorism risks
- Reputational risk insurance («Assistance»)
-

Associations / Government / Public Private Partnerships

- Pandemic Re - designed to provide „after the event“ cover for pandemic related business recovery.
- FFA French Insurance Federation – compulsory health disaster coverage, extension to business interruption
- Pool Re - Pandemic and Cyber related solutions (discussion)
- ...

VII. Conclusion



1	The overall importance of Business Interruption incl. "Non-Traditional" = NDBI regularly found within under Top 10 Business Risks
2	Triggers / Scenarios are manifold and mostly very individual "Think the 'Unthinkable' → Holistic & recurring RM-Process advisable
3	NDBI – Scenarios vary from local/individual to Industry-wide → Accumulation Issues for Insurers in a complex & globalized world (VUCA)
4	Protection gap provides opportunities for mostly bespoke solutions (no standard product) → ENID* -challenge

* ENID – Event not in Datasets

Thank You

