AVIATION SAFETY MANAGEMENT

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15 January 2025

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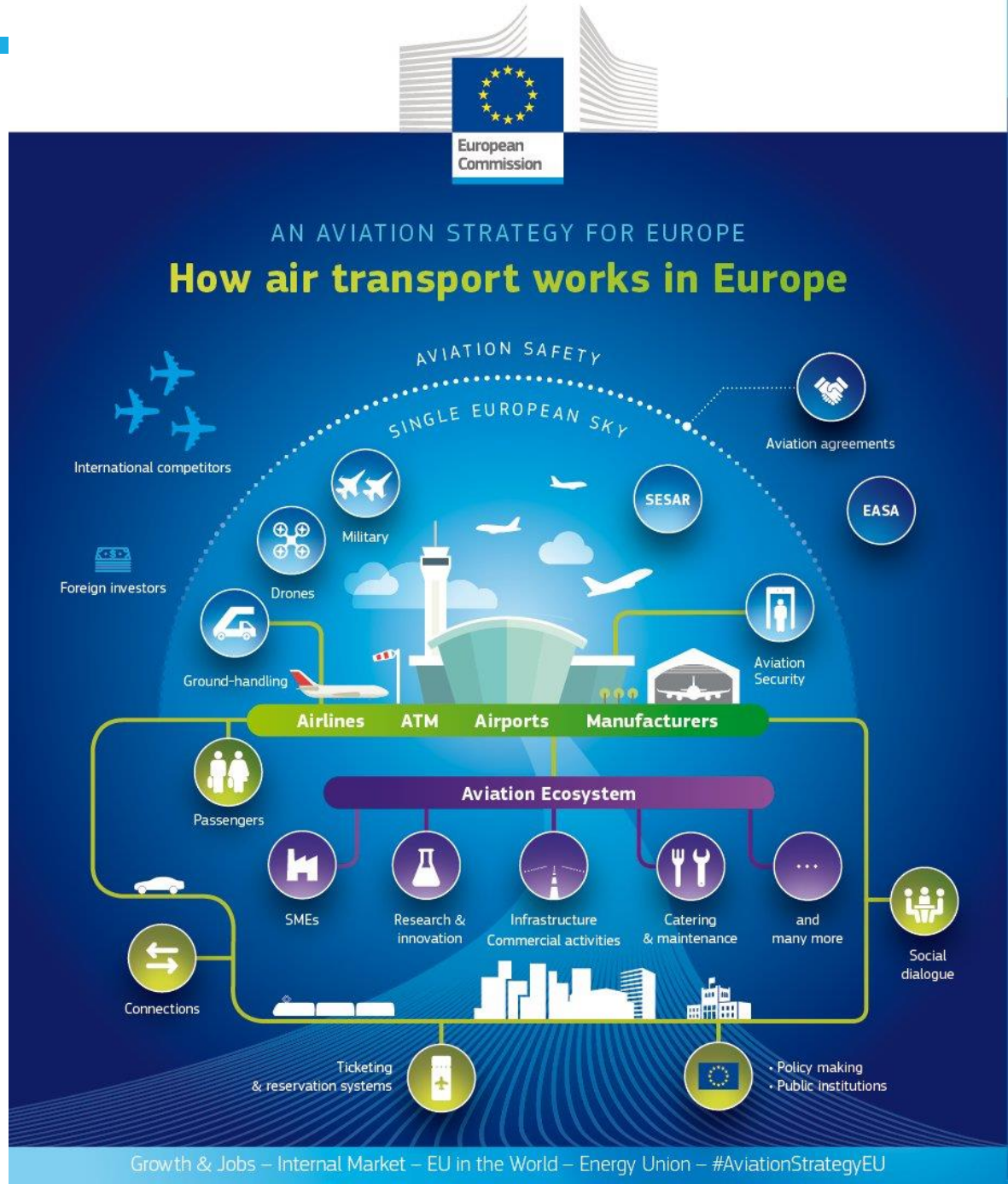
OUTLINE

- Introduction and the regulatory framework
- How is aviation safety managed and assessed?
- Challenges and opportunities

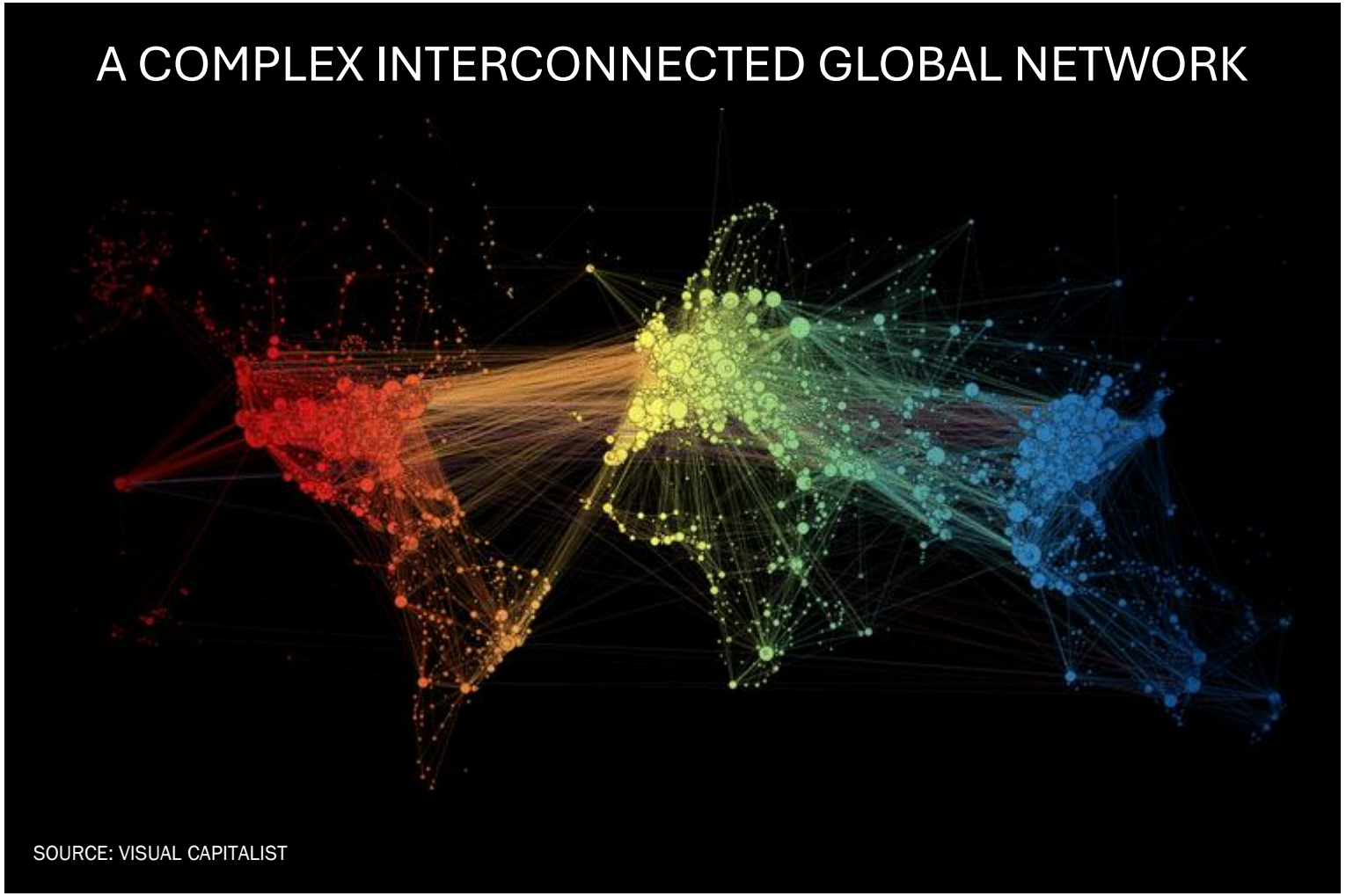
WHAT IS THE AIR TRANSPORT SYSTEM?

The air transport system refers to a complex, interconnected network of stakeholders, infrastructure, and processes that facilitate the safe, secure, efficient, and sustainable movement of passengers and cargo by air.



THE GLOBAL AVIATION INDUSTRY

- The global aviation industry connects over 67,000 routes, servicing more than 4.4 billion passengers annually (IATA, 2023).
- Aviation contributes approximately $4.1 trillion to global GDP (approximately 3.9%) and supports nearly 86 million jobs worldwide (Air Transport Action Group, 2024).
- Middle East aviation market represents around 8% of global passenger traffic, with consistent growth projections despite recent challenges (OAG, 2024).



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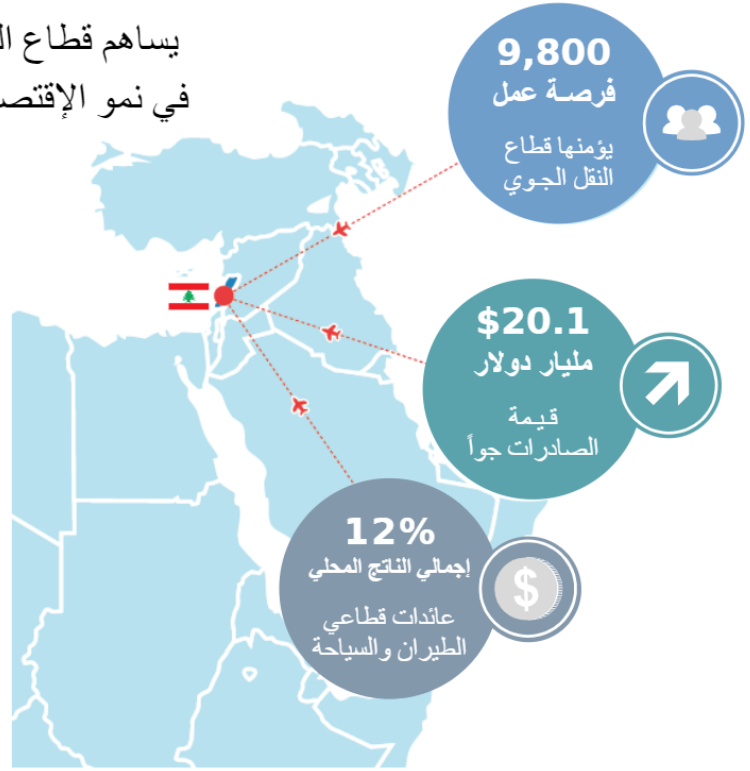
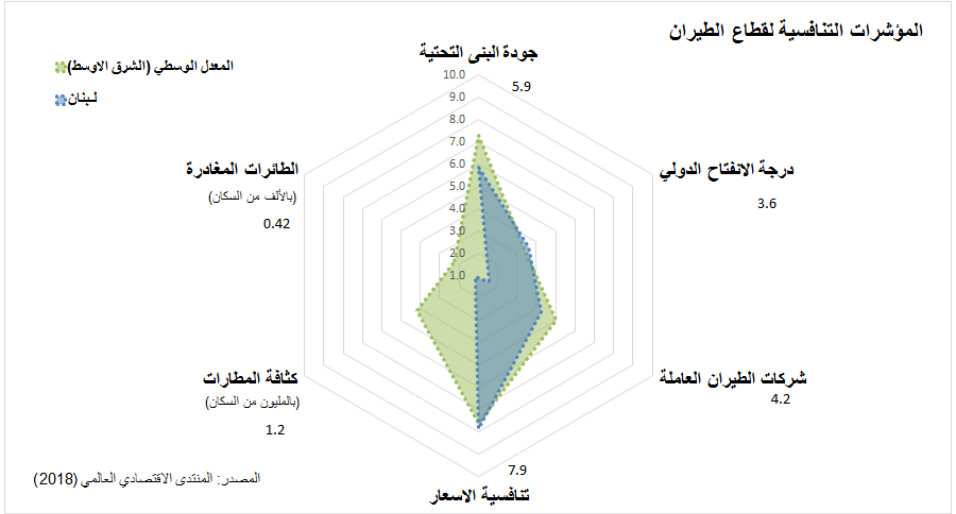
The air transport sector makes a major contribution to Lebanon's economy.

يساهم قطاع الطيران بشكل كبير
في نمو الإقتصاد اللبناني





KEEPING THE AVIATION GLOBAL NETWORK SAFE IS A KEY DRIVER TO GROWTH

Safety is a license to operate and has direct commercial implications:

- Boeing share price declined by more than 35%
- Jeju air share price dropped by 13%

WORLDWIDE SAFETY REGULATIONS ARE SET BY THE INTERNATIONAL CIVIL AVIATION ORGANISATION (ICAO)

- The Chicago Conference resulted in the Chicago Convention of December 1944, signed by 52 countries that created ICAO.

- The convention through **19 Annexes**, established the set of standards and recommended practices (SARPs) for civil aviation covering both technical and economic aspects.

Safety, security, airworthiness, infrastructure, and aircraft operations.

e.g. Annex 19; 17; 8; 6.

Market facilitation, economic regulation, and environmental considerations.

e.g. Annex 9; 16

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ICAO ANNEXES

Annex 1 Personnel Licensing
Annex 2 Rules of the Air
Annex 3 Meteorological Service for International Air Navigation
Annex 4 Aeronautical Charts
Annex 5 Units of Measurement to be Used in Air and Ground Operations
Annex 6 Operation of Aircraft
Annex 7 Aircraft Nationality and Registration Marks
Annex 8 Airworthiness of Aircraft
Annex 9 Facilitation
Annex 10 Aeronautical Telecommunications
Annex 11 Air Traffic Services
Annex 12 Search and Rescue
Annex 13 Aircraft Accident and Incident Investigation
Annex 14 Aerodromes
Annex 15 Aeronautical Information Services
Annex 16 Environmental Protection
Annex 17 Security: Safeguarding International Civil Aviation Against Acts of Unlawful Interference
Annex 18 The Safe Transport of Dangerous Goods by Air
Annex 19 Safety Management

INTERNATIONALLY

International and regional organisations

- ICAO – International Civil Aviation Organisation
- EASA – European Aviation Safety Agency
- FAA – Federal Aviation Administration

Trade associations

- IATA – International Air Transport Association
- ACI – Airport Council International
- TIACA – The International Air Cargo Association

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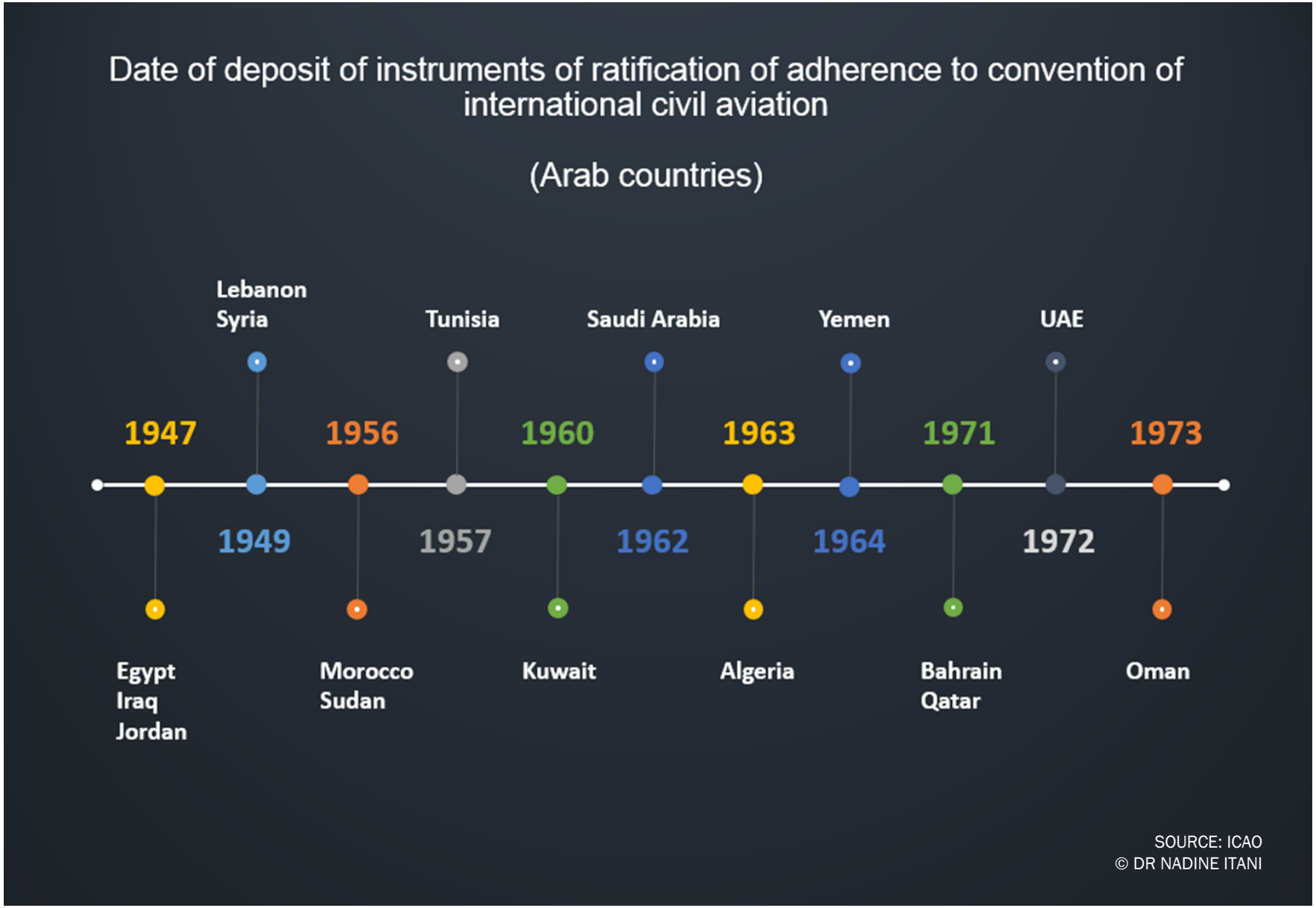
NATIONALLY

Every country has a national aviation authority, responsible for ensuring that:

1. The aviation industry meets the highest **safety** standards.
2. Consumers have choice, value for **money**, and are protected and treated fairly when they fly.
3. The aviation industry manages **security** risks effectively.

CAA governs and regulates **civil aviation safety**, including certifying aircraft airworthiness, licensing pilots and air traffic controllers, licensing airports and enforcing regulations.

وقَع لبنان على اتفاقية شيكاغو للطيران المدني الدولي عام 1949



التنظيم الاداري لقطاع النقل الجوي في لبنان

وزارة الاشغال العامة والنقل

Ministry of Public Works & Transport

المديرية العامة للطيران المدني

Directorate General of Civil Aviation

مطار رفيق الحريري الدولي - بيروت

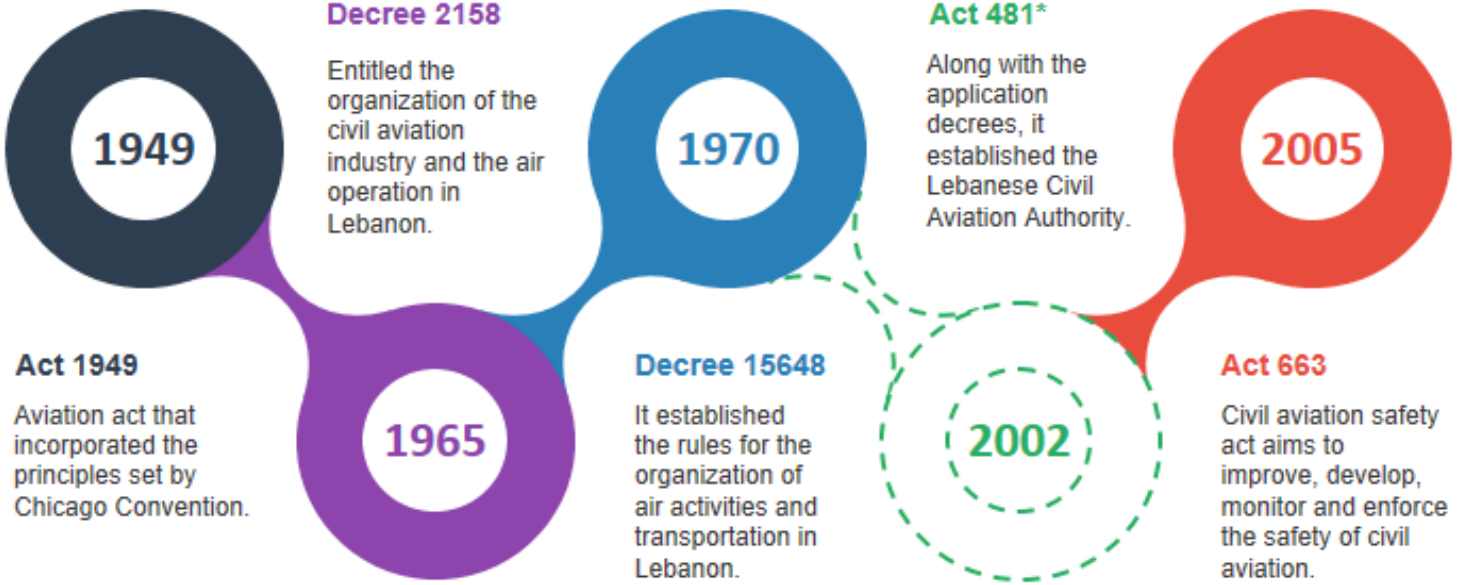
Beirut RH Intl. Airport

طيران الشرق الاوسط

Middle East Airlines

Lebanese aviation legislations

Timeline



- قانون الطيران رقم **1949** الصادر في 11 كانون الثاني 1949
- مرسوم رقم **2158** الصادر في 8 تموز 1965 تنظيم صناعة الطيران المدني واستثمار النقل الجوي في لبنان
- مرسوم رقم **15648** الصادر في 21 أيلول 1970 تنظيم العمل والنقل الجوي في لبنان
- قانون رقم **481** تاريخ **2002** ادارة قطاع الطيران المدني
- قانون رقم **663** تاريخ **2005** سلامة الطيران المدني

* Act 481 needs to be operational through Council of Ministers' appointment of the members of the LCAA. To date [JAN 2025] the LCAA is not yet formed and this has lead to considerable negative impacts on the administration of civil aviation in Lebanon.

Source: Middle East Aviation Research Society (mears.) – 2018 ©

WHAT IS AVIATION SAFETY AND HOW IT IS ASSESSED?

BASIC CONCEPTS

Safety is “the state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level”.

Safety management seeks to proactively mitigate safety risks before they result in aviation accidents and incidents.

The effectiveness of a State’s safety management activities is strengthened when implemented in a formal and institutionalized way through a State Safety Programme (SSP) and through Safety Management Systems (SMSs) for its service providers.

SOURCE: ICAO, 2019

ICAO

International Standards
and Recommended Practices

Annex 19 to the Convention on International Civil Aviation

Safety Management

Second Edition, July 2016

This edition supersedes, on 7 November 2019, all previous editions of Annex 19.

For information regarding the applicability of the Standards and Recommended Practices, see Chapter 2 and the Foreword.

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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CHAPTER 3. State safety management responsibilities 3-1

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3.2 State safety policy, objectives and resources 3-1
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3.5 State safety promotion 3-5

CHAPTER 4. Safety management system (SMS) 4-1

4.1 General 4-1
4.2 International general aviation — aeroplanes 4-2

CHAPTER 5. Safety data and safety information collection, analysis, protection, sharing and exchange 5-1

5.1 Safety data collection and processing systems 5-1
5.2 Safety data and safety information analysis 5-2
5.3 Safety data and safety information protection 5-2
5.4 Safety information sharing and exchange 5-3

ICAO

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INTERNATIONAL CIVIL AVIATION ORGANIZATION

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1. Primary aviation legislation (CE-1)..... APP 1-1
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3. State system and functions (CE-3)..... APP 1-2
4. Qualified technical personnel (CE-4)..... APP 1-2
5. Technical guidance, tools and provision of safety-critical information (CE-5)..... APP 1-2
6. Licensing, certification, authorization and approval obligations (CE-6)..... APP 1-2
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3. Principles of exception..... APP 3-2
4. Public disclosure..... APP 3-3
5. Responsibility of the custodian of safety data and safety information..... APP 3-3
6. Protection of recorded data..... APP 3-3

Welcome to the USOAP Continuous Monitoring Approach (CMA) website

ICAO's Universal Safety Oversight Audit Programme (USOAP) focuses on a State's capability in providing safety oversight by assessing whether the State has implemented the critical elements (CEs) of a safety oversight system effectively and consistently. This enables the State to ensure the implementation of ICAO's safety-related Standards and Recommended Practices (SARPs) and associated procedures and guidance material. In addition, it provides ICAO with a means to monitor continuously the States' fulfilment of their safety oversight obligations.

Launched in 1999

Embedded the CMA in 2010

ICAO carries out audits and other monitoring activities to determine the safety oversight capabilities of its Member States by:

- Assessing their effective implementation of the 8 CEs in 8 audit areas (i.e. LEG, ORG, PEL, OPS, AIR, AIG, ANS and AGA) through Protocol Questions (PQs); and
- Verifying the status of the Member States' implementation of:
  - Safety-related ICAO Standards and Recommended Practices (SARPs);
  - Associated procedures; and
  - Guidance material.

Audit Areas

1. Legislation and Regulations
Chicago Convention & Annex 2

2. Organization & Safety Oversight Functions
SAAQ

3. Personnel Licensing
Annexes 1 & 19

4. Aircraft Operations
Annexes 2, 6, 18, 19 & PANS-OPS

5. Airworthiness of Aircraft
Annexes 6, 7, 8, 16 & 19

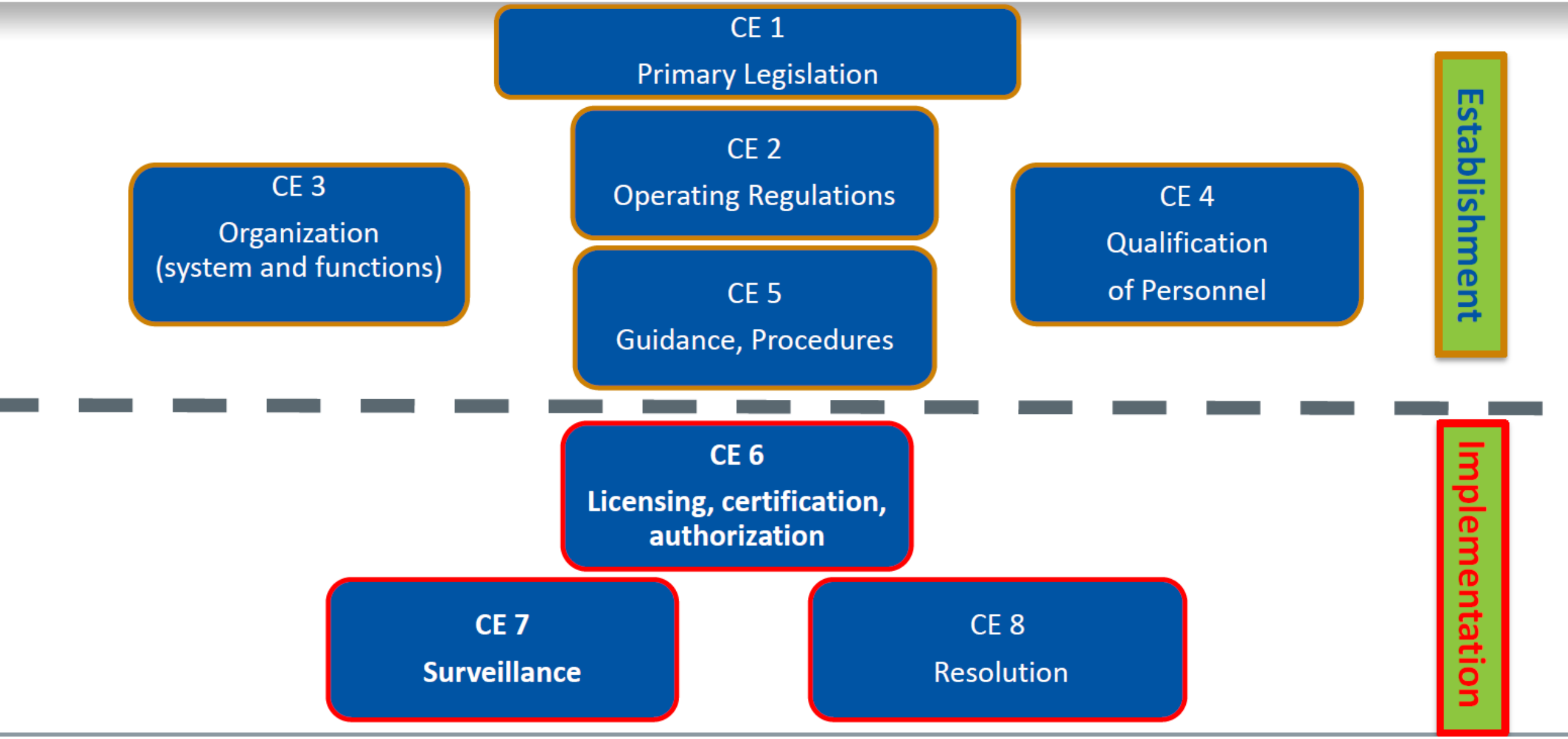
6. Accident & Incident Investigation
Annexes 13 & 19

7. Air Navigation Services
Annexes 2, 3, 4, 5 10, 11, 12, 15, 19 & PANS-ATM

8. Aerodromes
Annexes 14 & 19

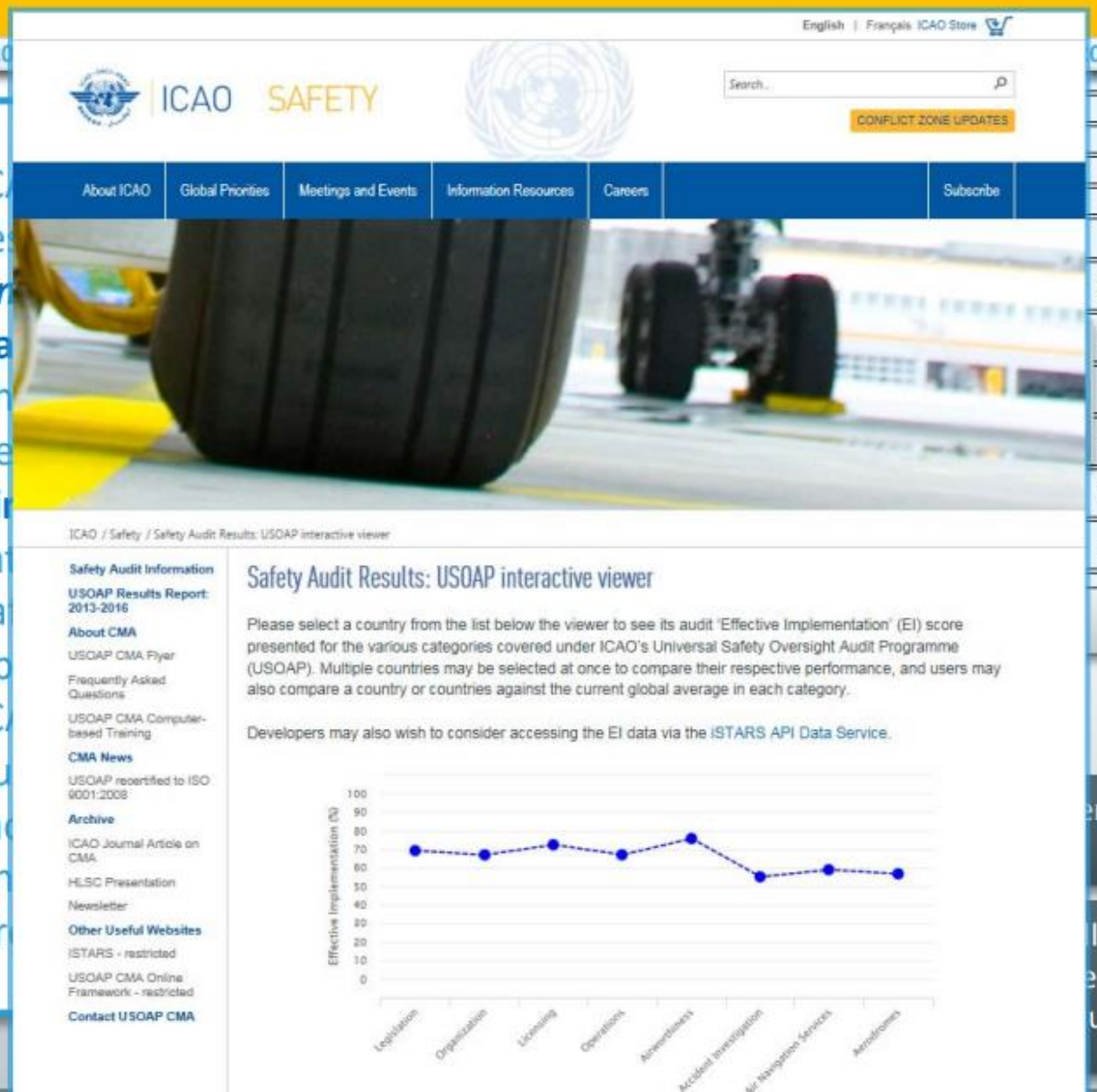
ICAO UNITING AVIATION

Critical Elements (CEs) of an Effective Safety Oversight System



Interactive viewer

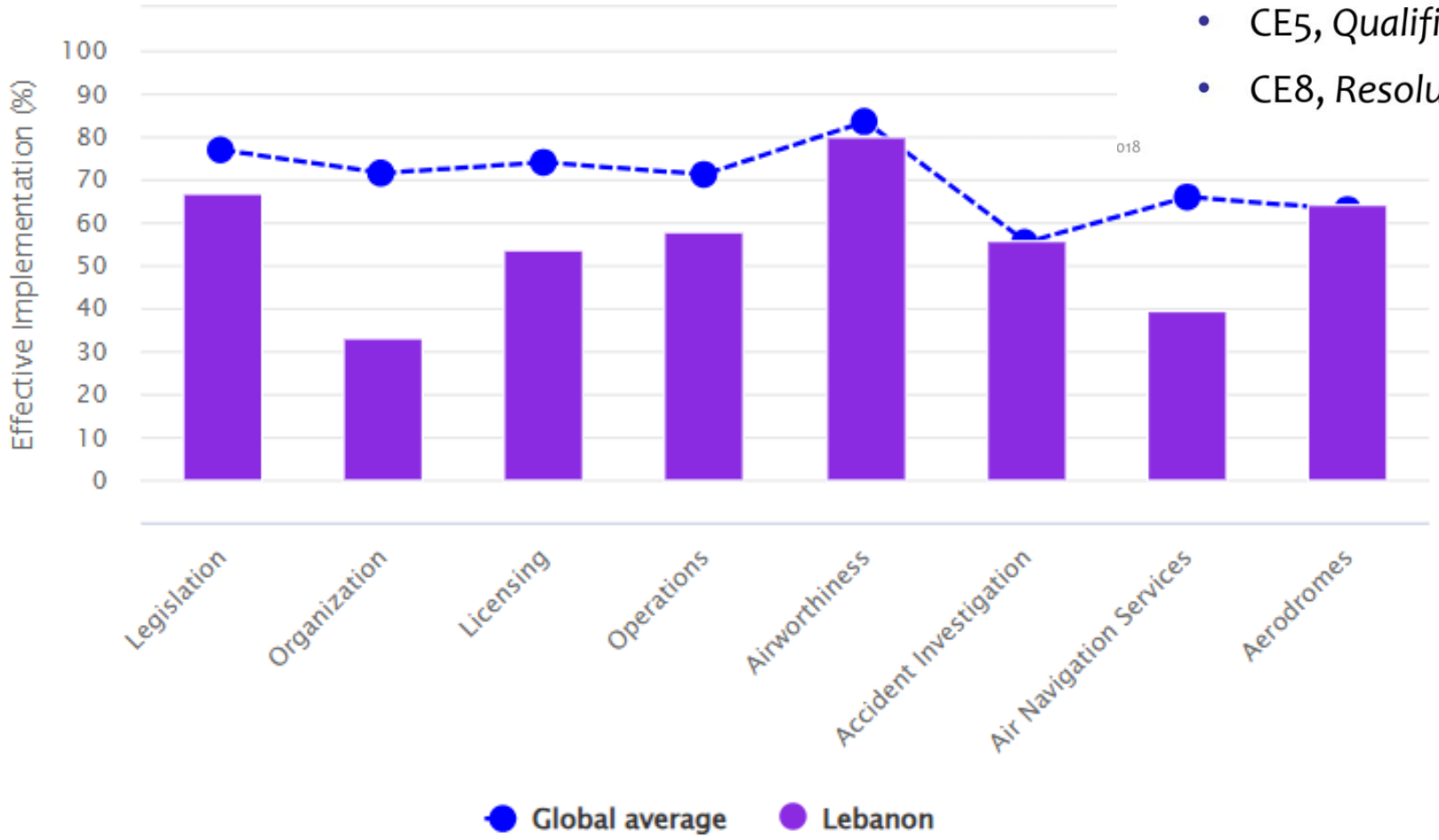
As of January 2013, safety oversight information is available on the ICAO public website:
URL: http://www.icao.int/safety/Pages/USOAP-Results.aspx



https://www.icao.int/safety/CMAForum/Pages/USOAP-Results.aspx

	Benin	2019	Compare
	Bhutan	2022	Compare
	Bolivia (Plurinational State of)	2021	Compare

EI of Audit Areas – Lebanon 2017

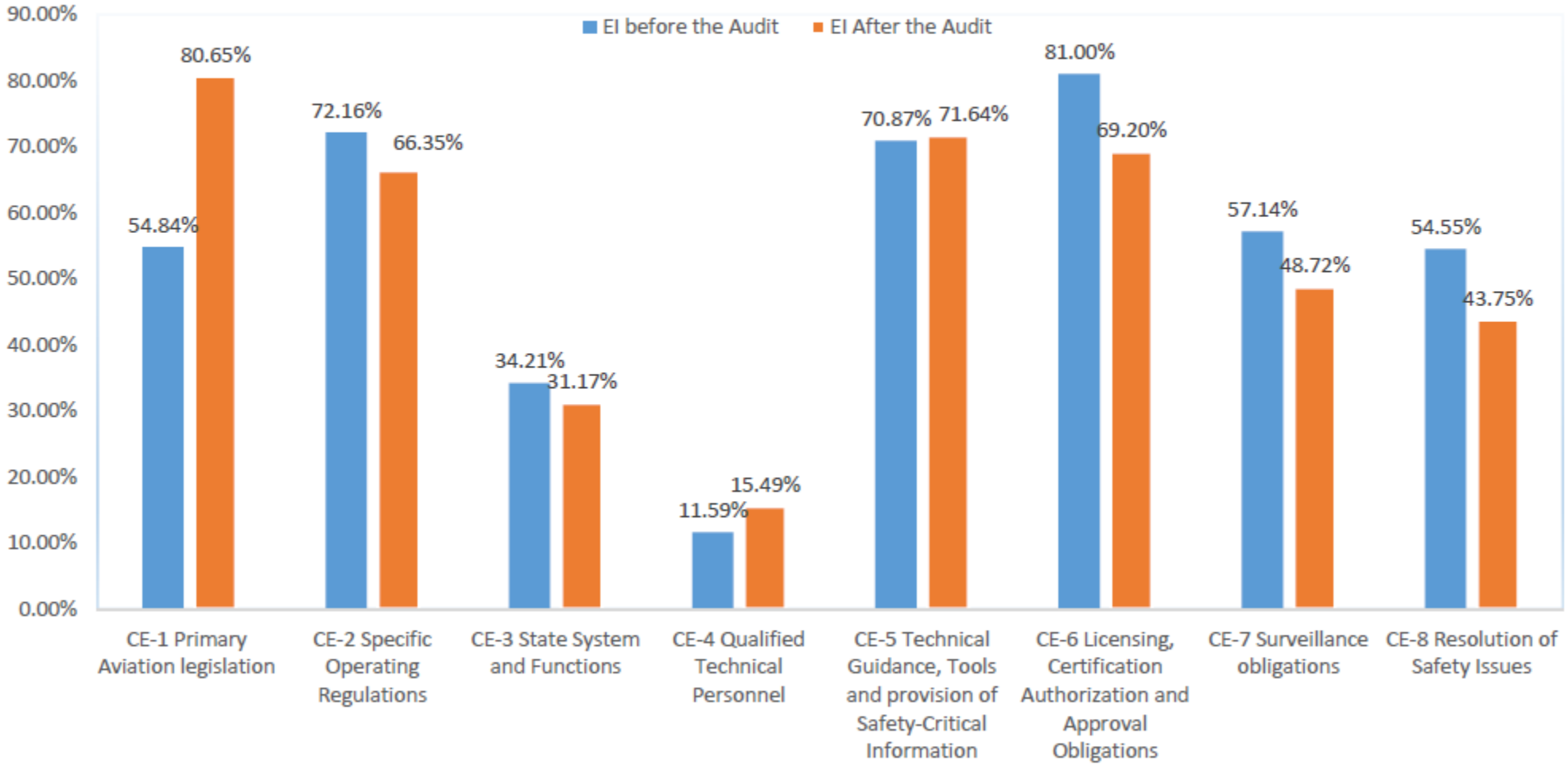


- Critical Elements *CEs* with low EI are;
  - CE4, *State Systems & Functions,* at 31.17%
  - CE5, *Qualified Technical Personnel,* at 15.49%and
  - CE8, *Resolution of safety issues*, at 43.75 %

Effective Implementation by Critical Elements of the Safety Oversight System

EI before Audit: 61.73%

EI after Audit: 57.44%

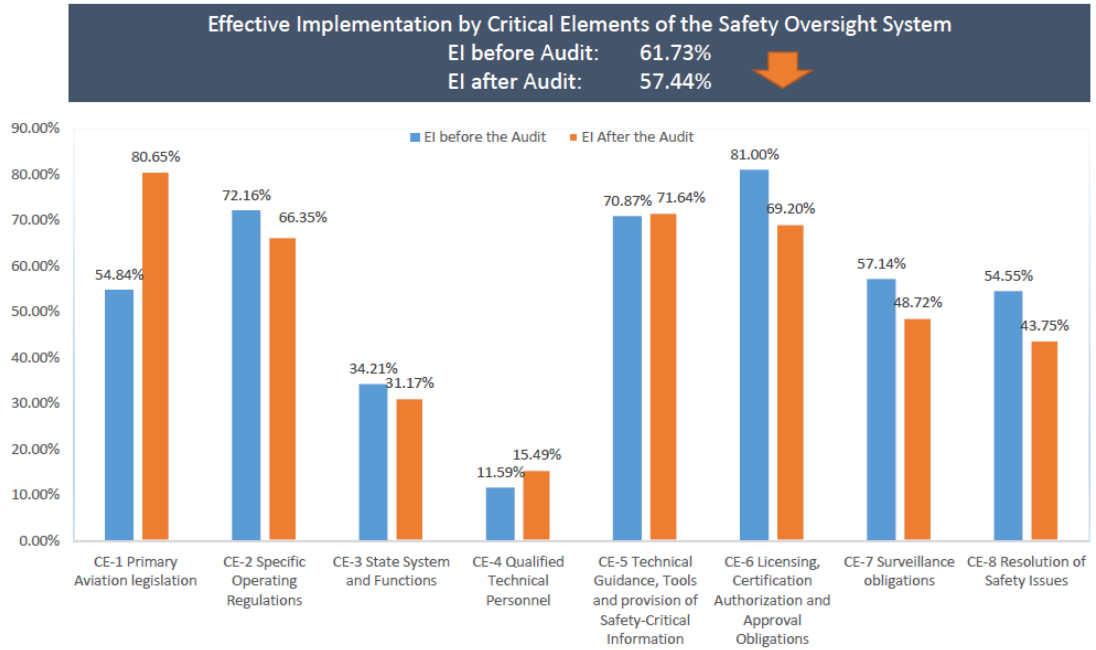


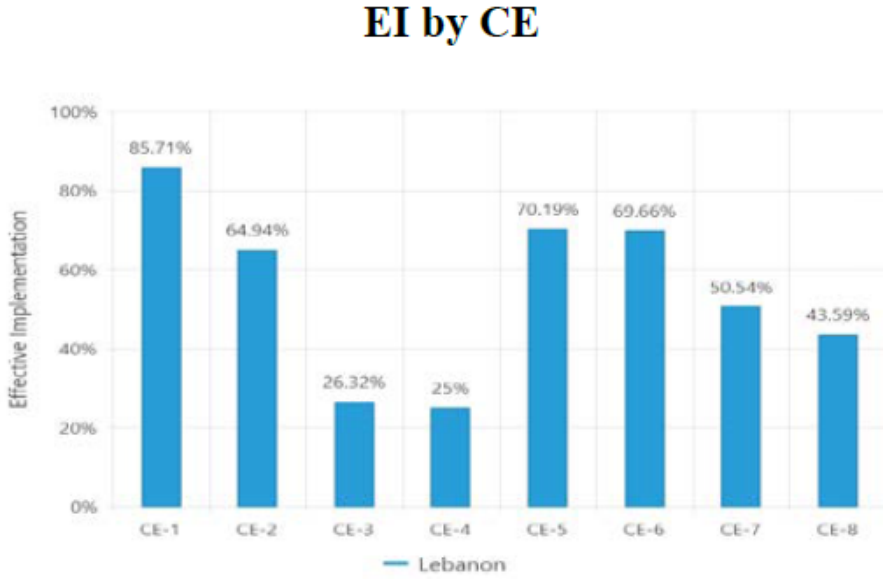
2.3 Lebanon was first audited in 2008. 4 other missions were conducted since then, the latest being in 2017. Since the initial audit, Lebanon has slightly improved its effective implementation (EI). The current overall result is **58.5%** EI.

2.4 The EI of the Priority Protocol Questions (PPQs) is **57.3%**. The PPQs are a subset of PQs classified as Priority PQs, which, if found not satisfactory, may indicate a lack of capability by a State to identify and/or resolve operational safety and fundamental accident investigation deficiencies effectively.

2.5 Implementation Critical Elements (CE-6, CE-7 and CE-8) have EI of **60.7%**.

2.6 With respect, EI by Audit Area, ORG, AIG, ANS and PEL represent the lowest EI around **45%**; while for the Critical Elements CE-3 and CE-4 are the lowest with EI around **25%**, followed by





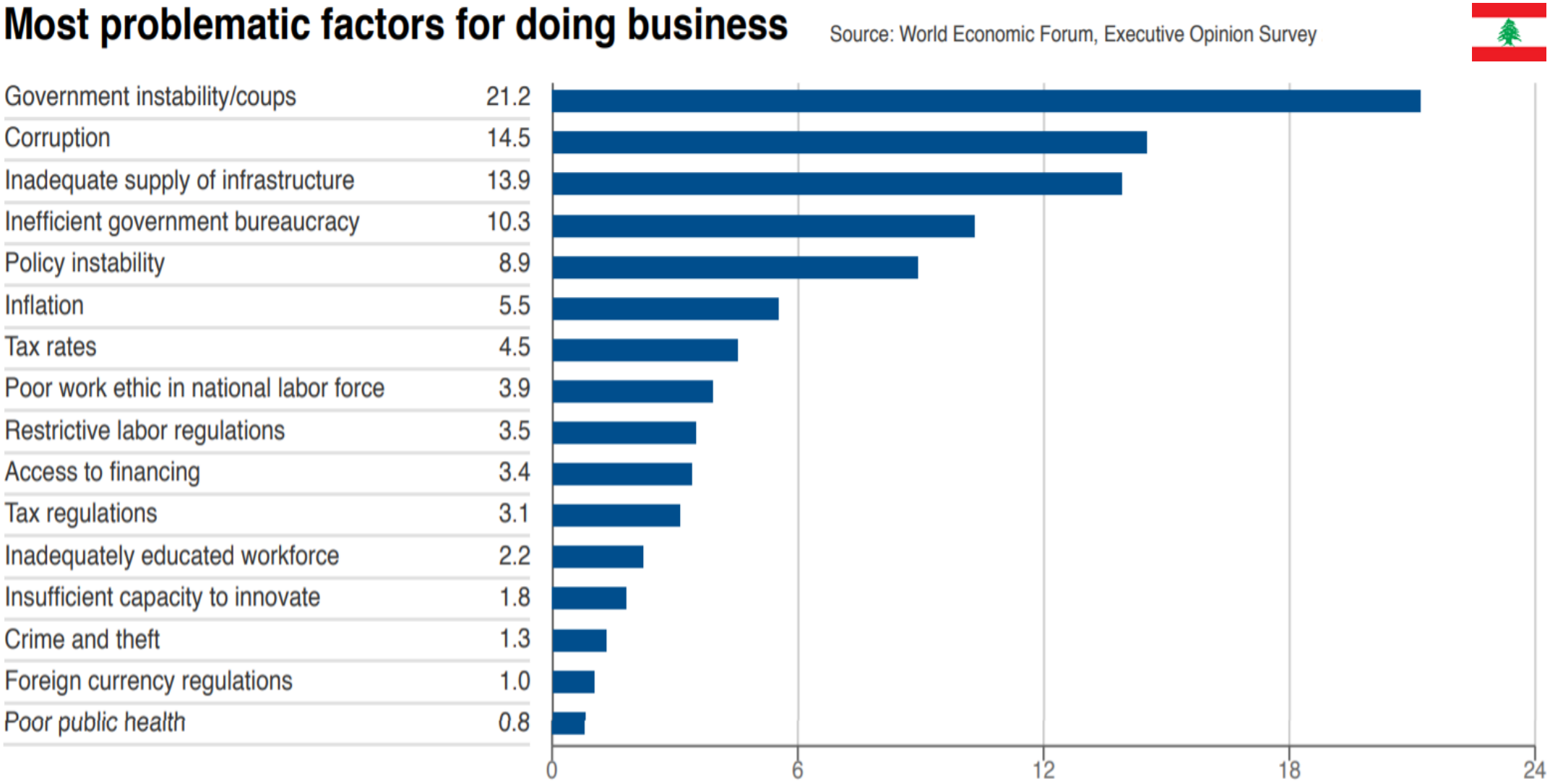
CHALLENGES AND OPPORTUNITIES

في لبنان خارطة الطريق لتطوير قطاع النقل الجوي متعثرة وتصدم بـ:

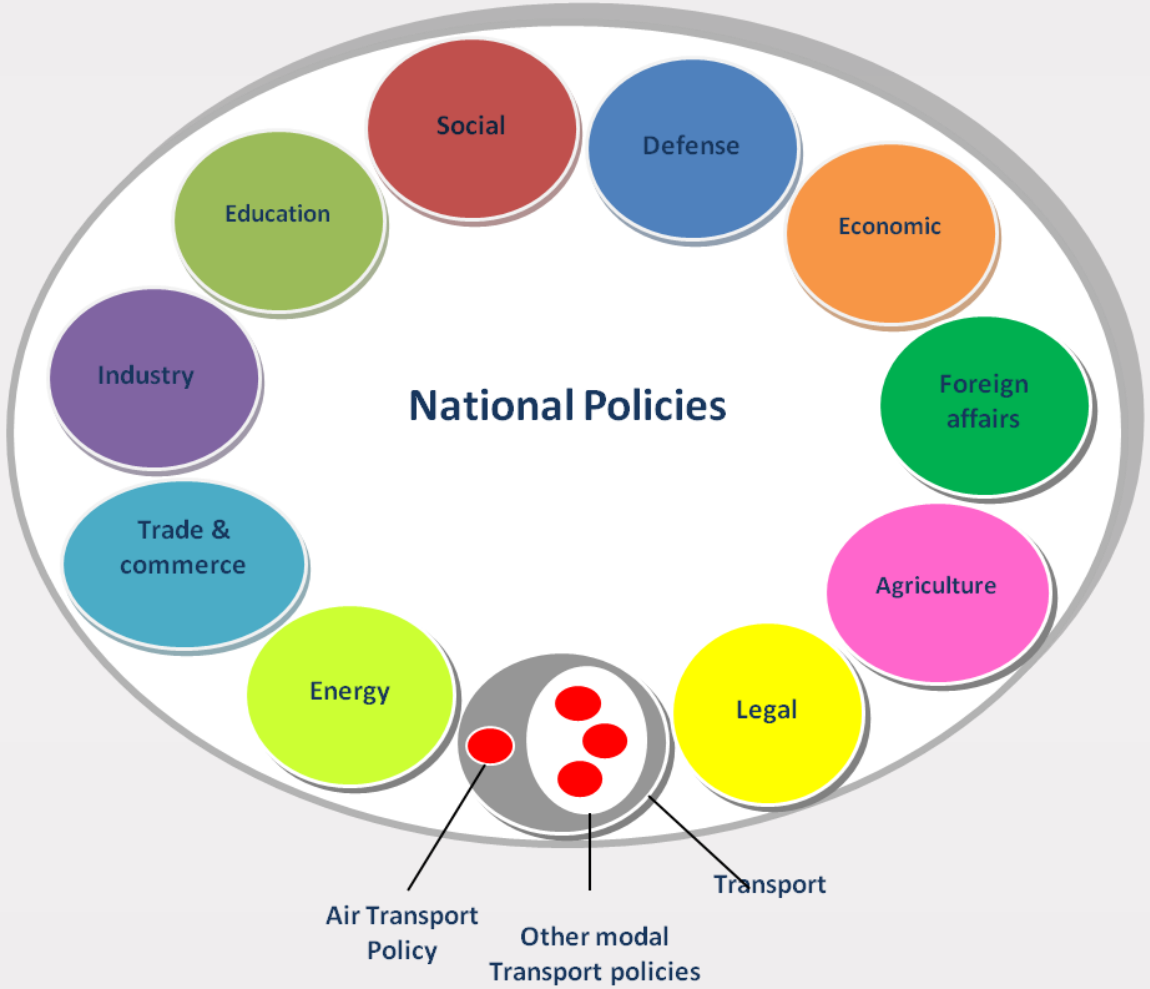
1. عقبات تشريعية (عدم نفاذ قوانين تنظيم قطاع الطيران)
2. عقبات إدارية (غياب الهيكلية الادارية الحديثة وغياب الاستقلالية الادارية)
3. عقبات تشغيلية (عدم الفصل بين الرقابة والتشغيل، ندرة الكوادر البشرية الكفوءة)
4. عقبات مالية (عدم الاستقلالية المالية وضعف القدرة التنافسية التسعيرية)
5. تحديات سياسية.

Most problematic factors for doing business

Source: World Economic Forum, Executive Opinion Survey



Context of National Air Transport Policy



اهمية تكامل سياسات النقل الجوي مع السياسات الوطنية التنموية

Air transport policy shall be integrated within national policy planning process.

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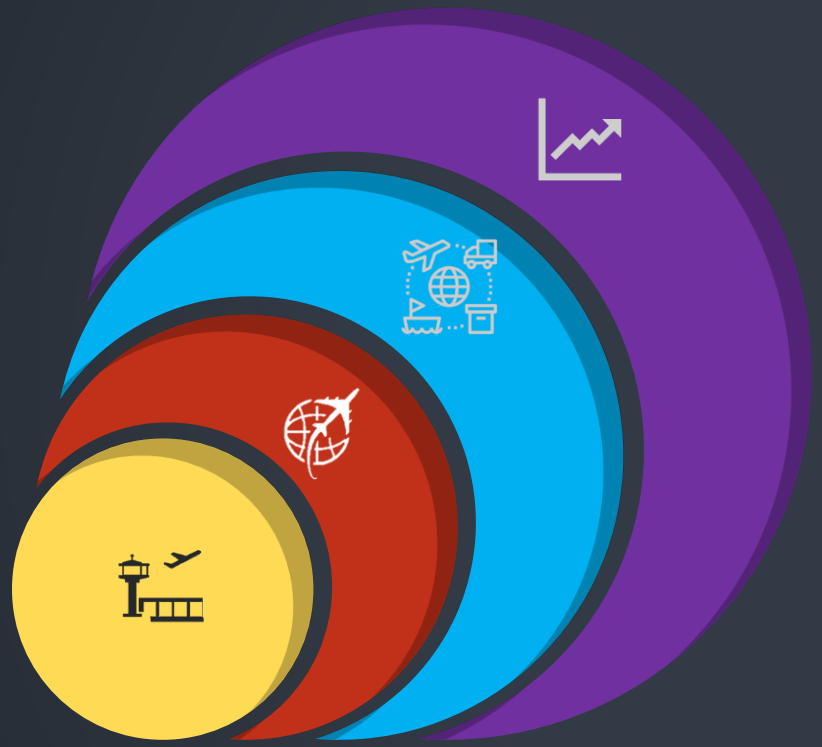
اهمية التخطيط المترابط للنقل الجوي



1. Lebanon economic vision
2. National transport plan
3. Civil aviation master plan
4. Airports development plan

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المخطط التوجيهي للطيران المدني

Civil Aviation Master Plan - Lebanon

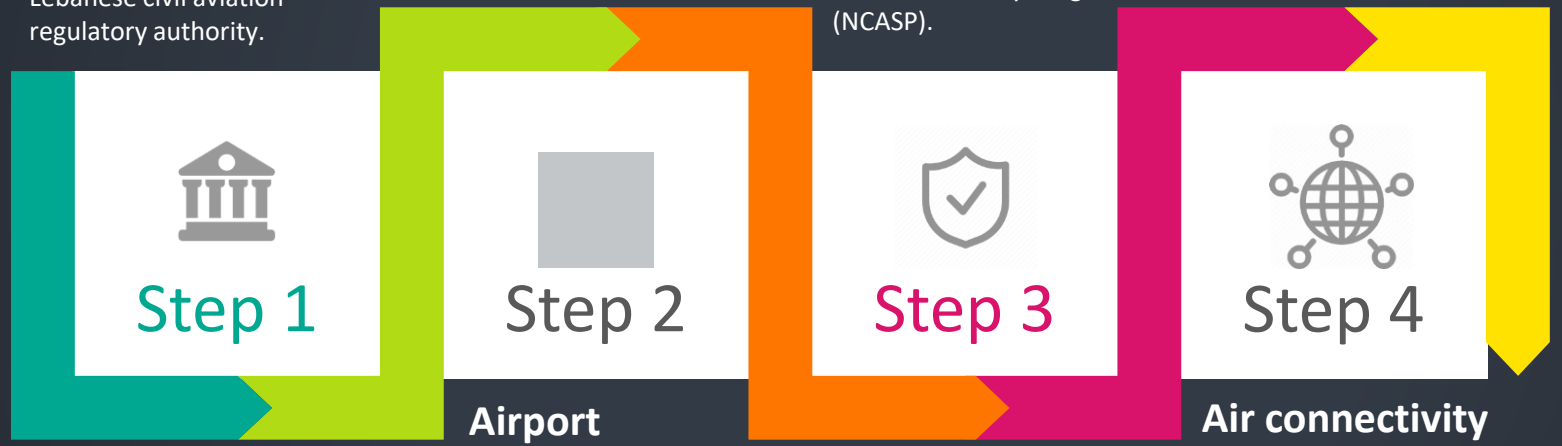
Four key goals

Institutional Reform

- Enact law 481/2002.
- Establish an autonomous and an independent Lebanese civil aviation regulatory authority.

Safety & Security

- Effective implementation of State Safety Plan (SSP) & Oversight CMA.
- Endorse National Civil Aviation Security Program (NCASP).



Airport Infrastructure

- Airports Development Plan (Beirut & Quleaat)
- Establish BIAC
- Mobilize public - local private - community resources.

Air connectivity

- Implement the full liberalization of air transport regulations (Ministerial decree year 2000).
- Optimize airspace infrastructure.
- Upgrade MEA routes and promote low cost carriers' market.

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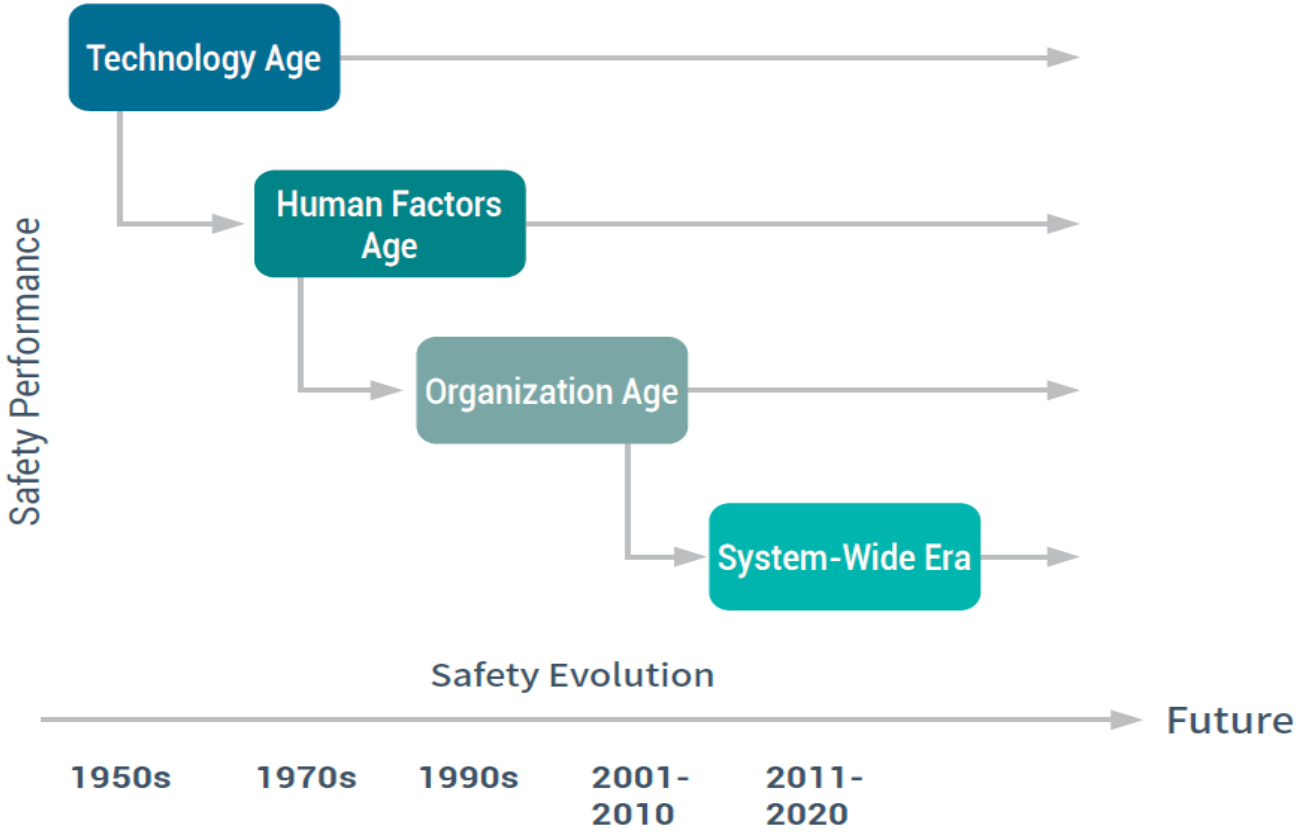
Questions?

EVOLUTION OF AVIATION SAFETY FOCUS



SOURCE: ICAO, 2018

AIR TRANSPORT IS BY FAR THE SAFEST MODE OF TRANSPORT

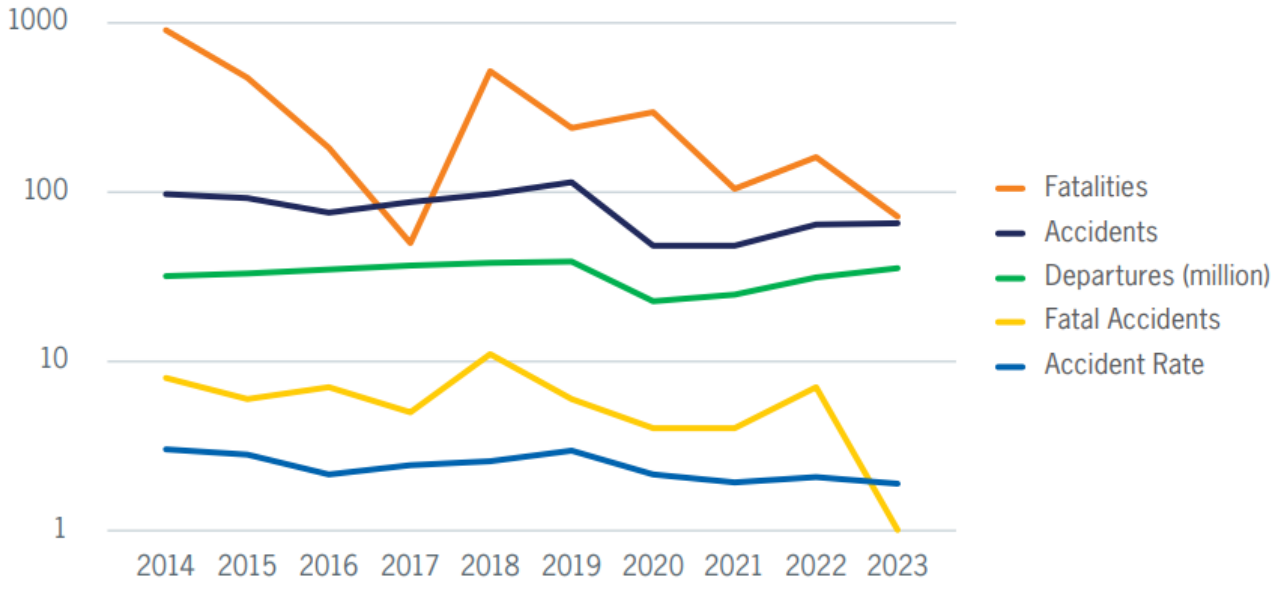


Chart 6. | Historical trends for scheduled commercial operations

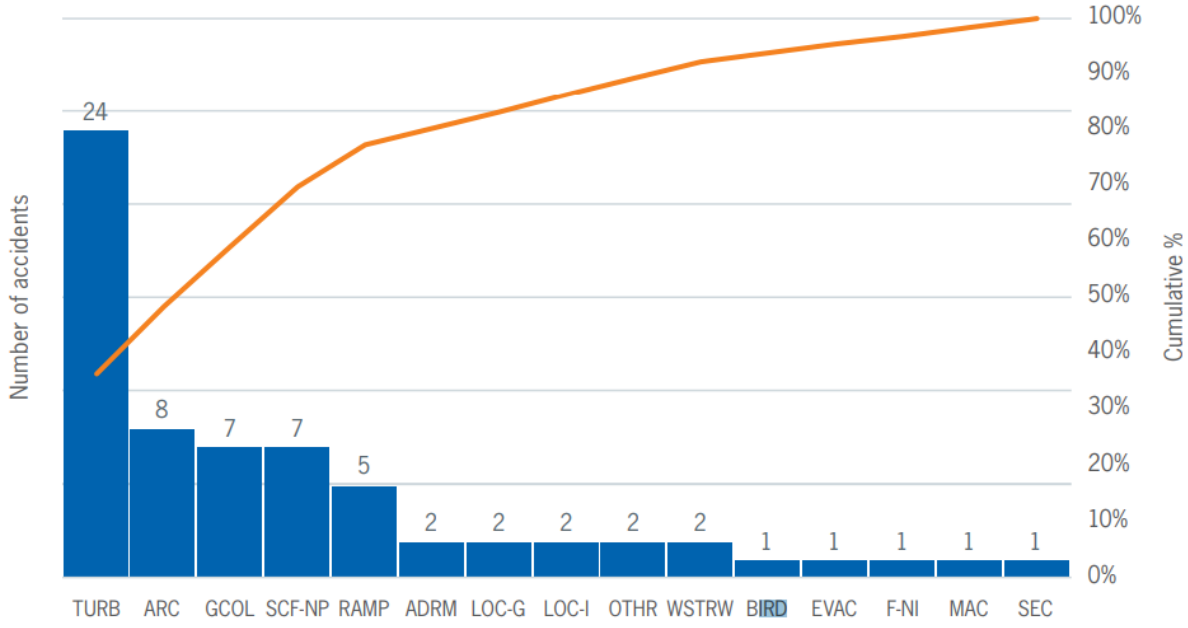


Chart 10. | Total accidents by occurrence category in 2023

SOURCE: ICAO SAFETY REPORT, 2024