

CLIMATE RISKS IN THE ENERGY SECTOR

THE 6TH FORUM ON THE CLIMATE-ENERGY SECURITY NEXUS

CÉSAR CONTRERAS

TECHNICAL CHIEF OF STAFF OF THE DEPUTY SECRETARY FOR PLANNING AND ENERGY TRANSITION

OVERVIEW OF THE ENERGY SECTOR

2014

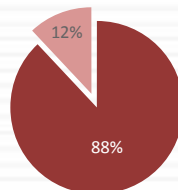
119 million
inhabitants



406 cities



75% of the total
population is located in
cities



30.7 million vehicles using
petrol and diesel



2029

137 million
inhabitants

503 cities

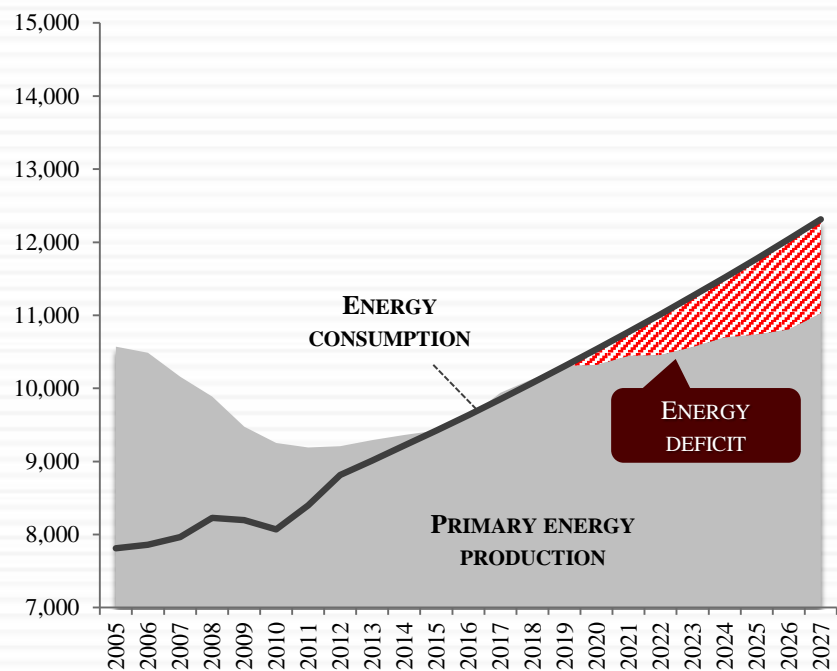
90 % of the total
population will be
located in cities*

39.8 million vehicles will
use petrol and diesel

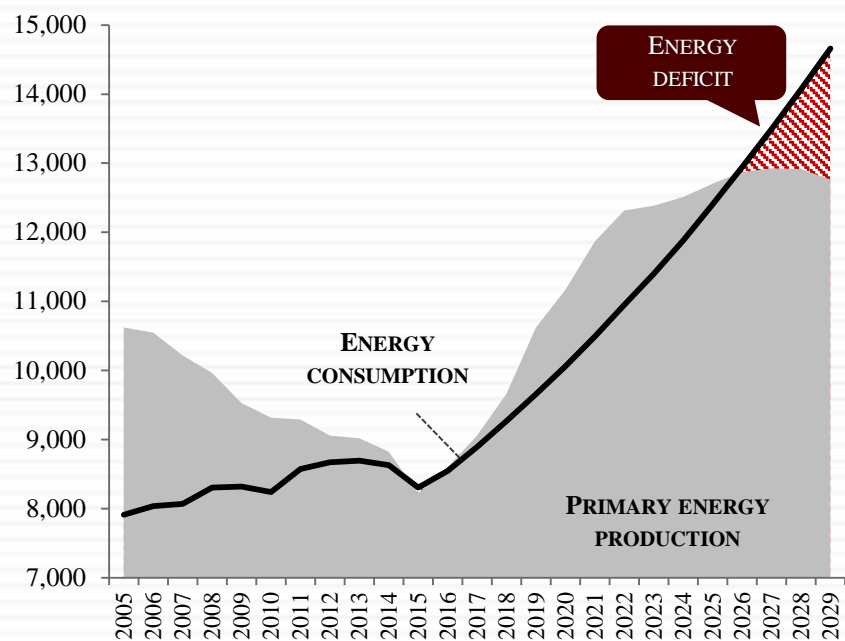
OVERVIEW OF THE ENERGY SECTOR

MEXICO: ENERGY PRODUCTION, CONSUMPTION AND ECONOMIC GROWTH (PETAJOULES)

2013: BEFORE ENERGY REFORM



2015: AFTER ENERGY REFORM



CLIMATE CHANGE OVERVIEW

MAJOR HURRICANE HISTORY



CLEAN ENERGY AND CLIMATE POLICY

2012	2013	2014	2015
<ul style="list-style-type: none">CLIMATE CHANGE LAW	<ul style="list-style-type: none">INTERSECRETARIAL COMMISSION (14 MINISTRIES)CLIMATE CHANGE NATIONAL STRATEGY (10-20-40 YEARS VISION)ENERGY REFORM	<ul style="list-style-type: none">SPECIAL PROGRAMS:<ul style="list-style-type: none">✓ CLIMATE CHANGE✓ SUSTAINABLE USE OF ENERGY✓ RENEWABLES ENERGIES	<ul style="list-style-type: none">NDCs (MARCH 27)ENERGY TRANSITION ACTCEMIE (SOLAR, WIND GEO, OCEAN AND BIO)

GENERAL LAW ON CLIMATE CHANGE (2012)

OBJETIVES

- MOVING TOWARDS A COMPLETIVE SUSTAINABLE AND LOW CARBON EMISSIONS ECONOMY.
- REDUCE VULNERABILITY FORM ADVERSE EFFECTS ON CLIMATE CHANGE.
- ENSURE COORDINATION AMONG ALL LEVELS OF FEDERAL GOVERNMENT.

GOALS

- REDUCING EMISSIONS (BASE LINE 2000):
 - 30% TO 2020
 - 50% TO 2050
- CLEAN ENERGY GENERATION:
 - 35% TO 2024

INSTRUMENTS

- CLIMATE CHANGE NATIONAL STRATEGY
- SPECIAL CLIMATE CHANGE PROGRAM

SPECIAL CLIMATE CHANGE
PROGRAM 2014-2018

OBJETIVES

- MITIGATION AND ADAPTATION TARGETS / ACTIONS
- ALLOCATES RESPONSIBLE FOR EACH GOAL
- REVIEWED EVERY TWO YEARS (INECC)

CLEAN ENERGY AND CLIMATE POLICY

SPECIAL PROGRAM ON CLIMATE CHANGE: ENERGY SECTOR

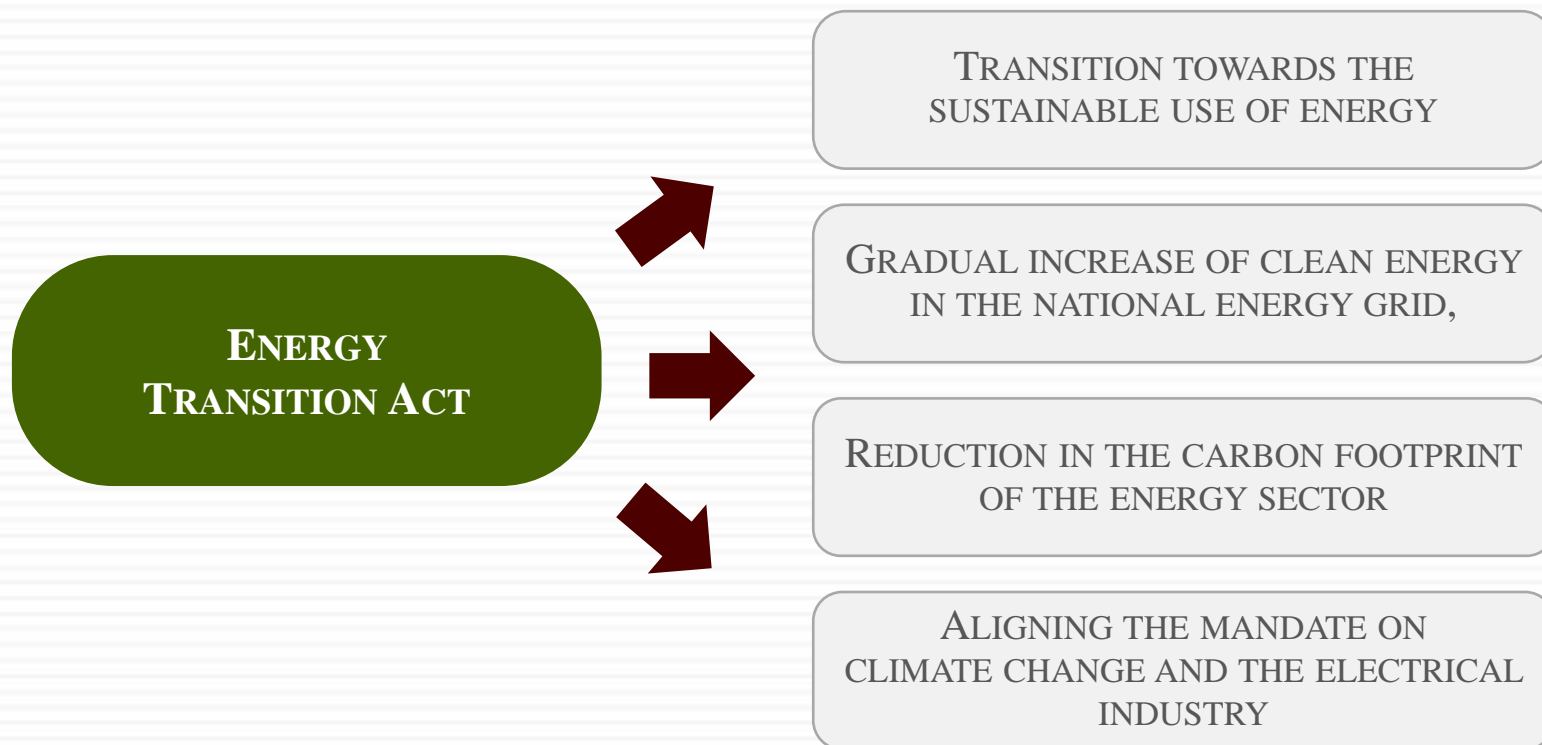
MITIGATION

- **61.3%** OF MITIGATION COMMITMENTS.
- REDUCTION OF **25%** OF INTENSITY OF EMISSIONS PER MW/H, BETWEEN 2013 AND 2018.
- MITIGATE **18.7** MTCO₂E FROM CLEAN ENERGY GENERATION.

ADAPTATION

- OPTIMIZE CLIMATE EVENTS RESPONSE PROGRAMS
- GENERATE MANAGEMENT PROGRAMS ON VULNERABILITY AND INCREASE RESILIENCE OF THE ENERGY INFRASTRUCTURE.
- REFORESTATION AND CONSERVATION PROGRAMS AND MANAGEMENT OF BASINS IN HYDROELECTRIC POWER PLANTS.

CLEAN ENERGY AND CLIMATE POLICY



CLEAN ENERGY AND CLIMATE POLICY

MAIN AMENDMENTS

**ADVISER BOARD FOR
ENERGY TRANSITION**



PLANNING INSTRUMENTS

GOALS

- FEDERAL GOVERNMENT
 - ELECTRICAL INDUSTRY
 - ACADEMY
 - ONGs
-
- TRANSITION STRATEGY TO PROMOTE CLEANER FUELS AND TECHNOLOGIES USE
 - NATIONAL PROGRAM FOR SUSTAINABLE ENERGY USE
 - SPECIAL PROGRAM OF ENERGY TRANSITION
-
- CLEAN ENERGY GENERATION GOALS:
 - 25% TO 2018
 - 30% TO 2021
 - 35% TO 2024

CLIMATE CHANGE SCENARIOS

HYDROMETEOROLOGICAL HAZARDS GENERATION, TRANSMISSION AND DISTRIBUTION

TROPICAL CYCLONES



PRECIPITATION > 70 MM



CLIMATE CHANGE SCENARIOS

HYDROMETEOROLOGICAL HAZARDS GENERATION, TRANSMISSION AND DISTRIBUTION

TEMPERATURE < 3°

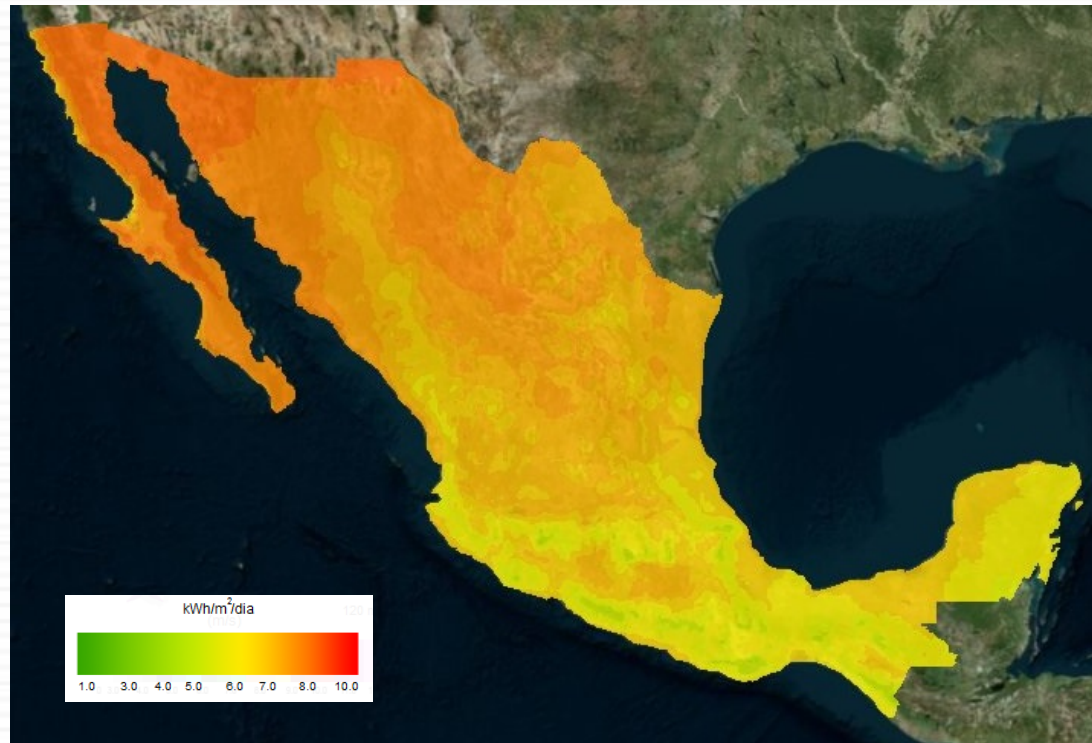


TEMPERATURE > 35°





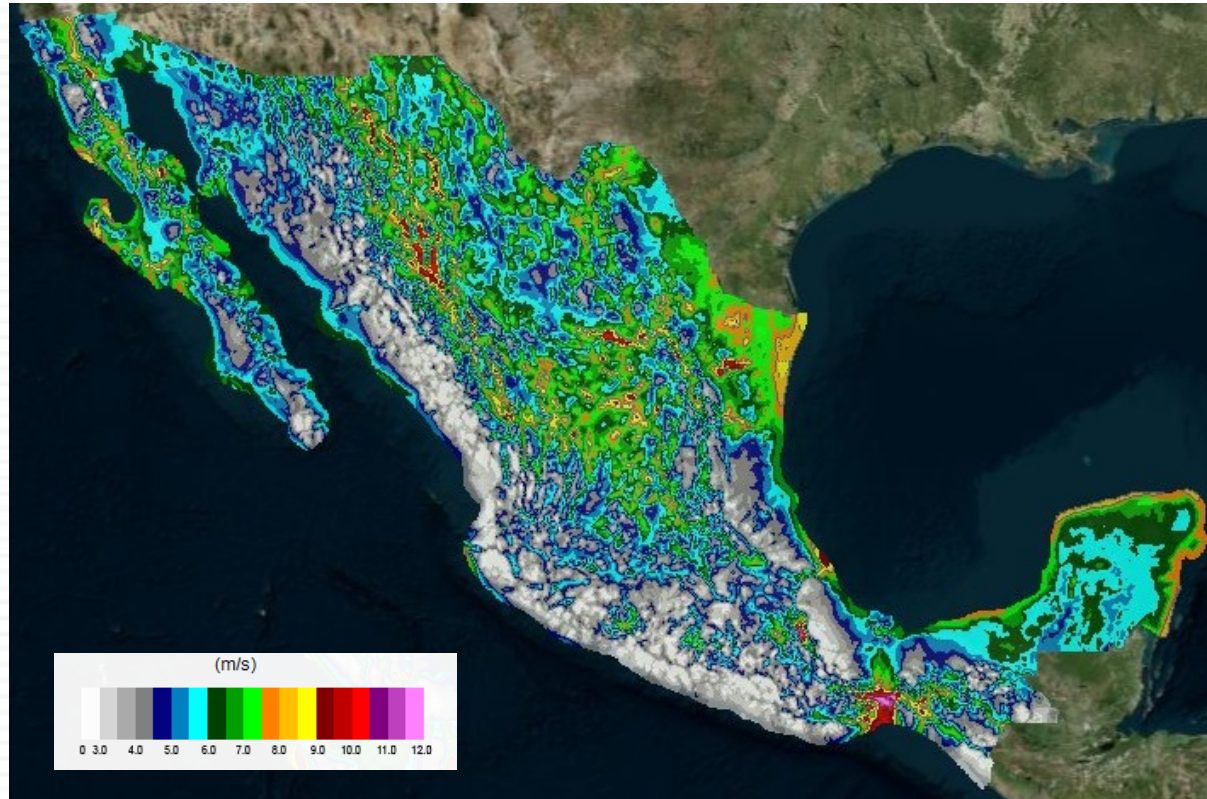
SOLAR: MAP OF DIRECT IRRADIATION DURING JUNE



AVERAGE DAILY IRRADIATION IN MEXICO IS ABOUT 5.5 KWH/M²/D, AND CAN REACH VALUES HIGHER THAN 8.5 KWH/M²



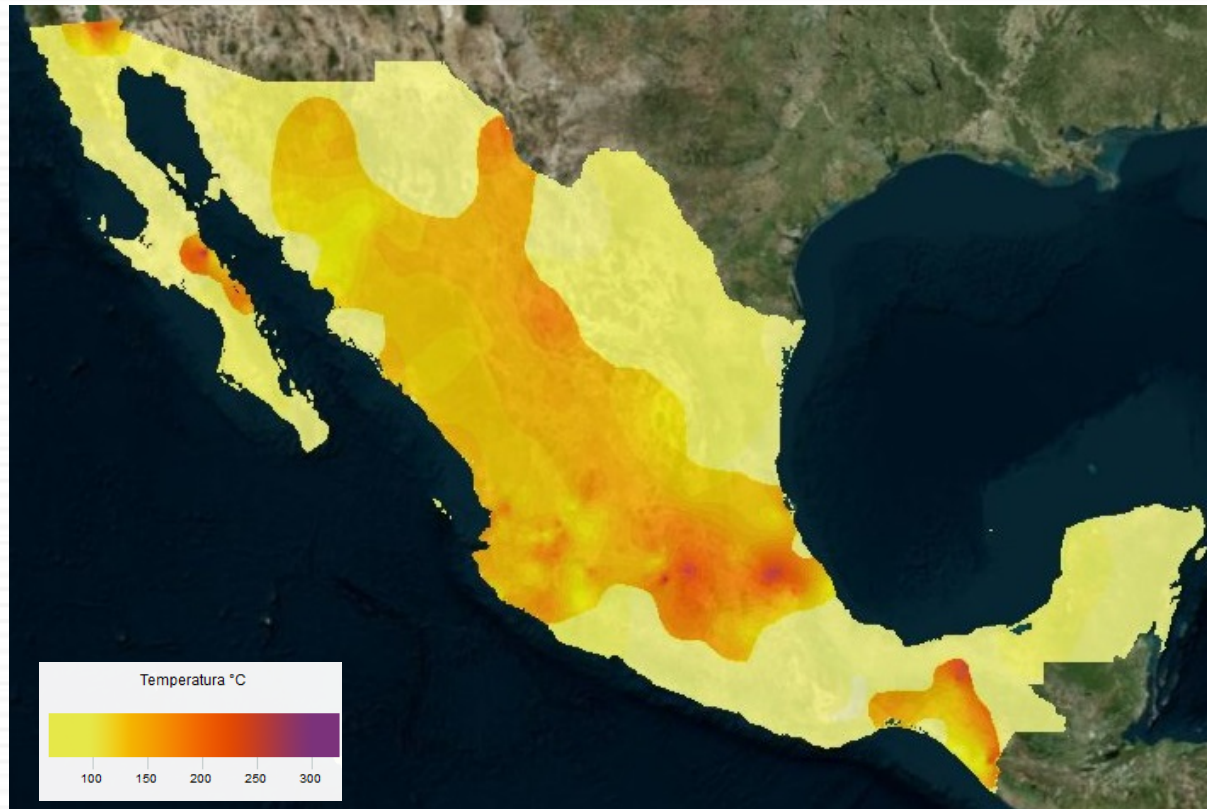
WIND: POWER DENSITY
80 METERS DURING MARCH (W/M2)



STUDIES TO CHARACTERIZE THE WIND RESOURCE IN REGIONS OF THE ISTHMUS OF TEHUANTEPEC, THE PENINSULAS OF YUCATAN AND BAJA CALIFORNIA, AND THE NORTHERN REGION OF THE GULF OF MEXICO...



GEOHERMAL RESOURCES IN MEXICO (° C)



GEOHERMAL POTENTIAL BASED ON THE CENSUS OF MORE THAN 1.3 THOUSAND HOT SPOTS ESTIMATED BY THE FEDERAL ELECTRICITY COMMISSION.

TASK FORCE (JOIN ACTIVITIES)

- **APPLIANCE STANDARDS AND LABELING TECHNICAL EXCHANGE**
MOVING FORWARD TOWARDS ALIGNMENT ON RESIDENTIAL REFRIGERATORS AND ELECTRIC MOTORS STANDARDS
- **ISO 50001 FOR LARGE ENERGY USERS**
COOPERATION TOWARDS A HARMONIZED PERSONAL CREDENTIALING PROGRAM AND PILOT PROJECTS IN INDUSTRIAL AND COMMERCIAL FACILITIES.
- **POWER SECTOR TRANSFORMATION**
GREATER CROSS-BORDER FLOWS OF RENEWABLE ENERGY
- **EARLY WARNING SYSTEM**
- **REDUCING METHANE EMISSION IN THE OIL AND GAS SECTOR**

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