



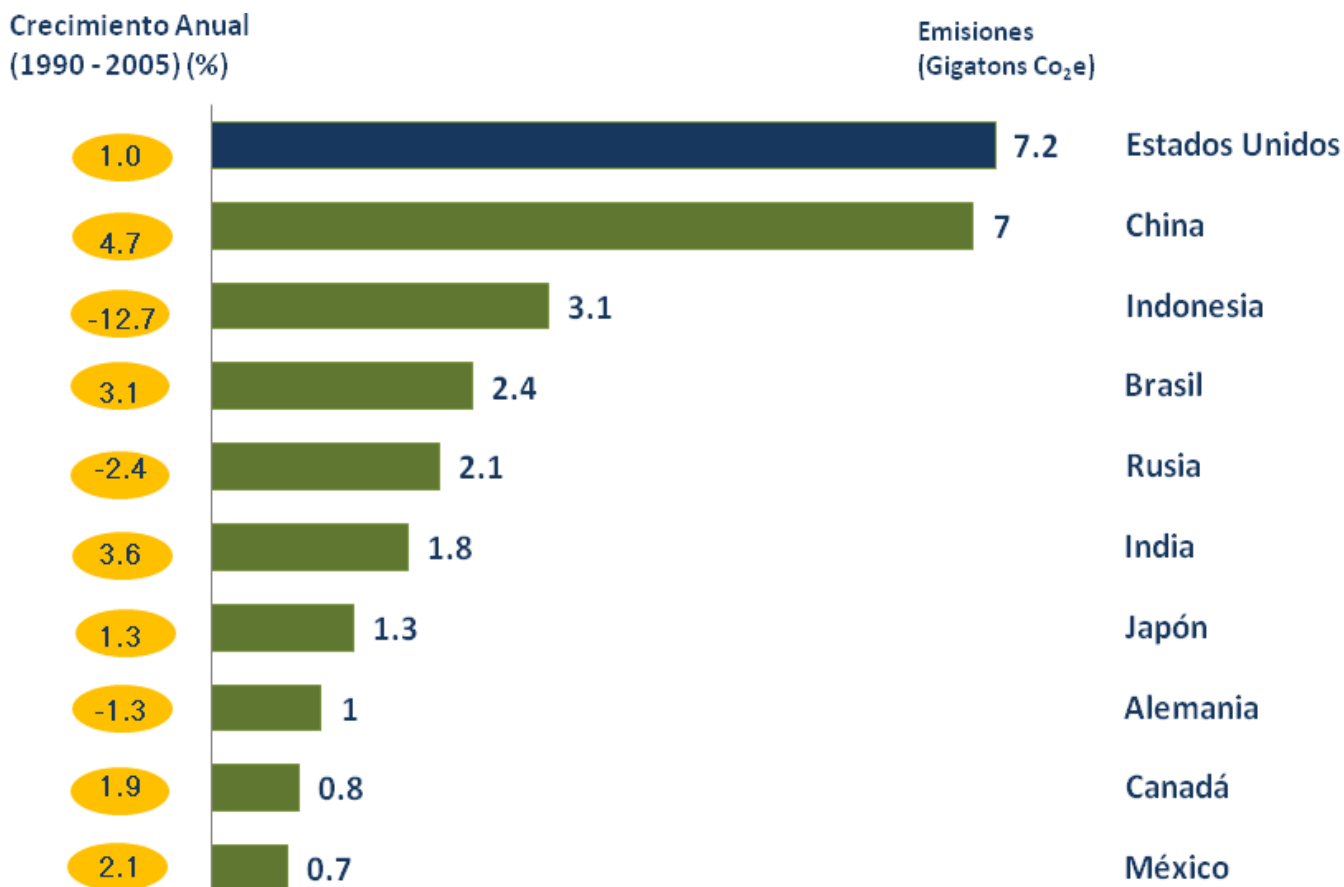
MÉXICO: SECTORS, COSTS, POTENTIAL OFFSETS AND CLIMATE CHANGE POLICIES

Gabriel Quadri

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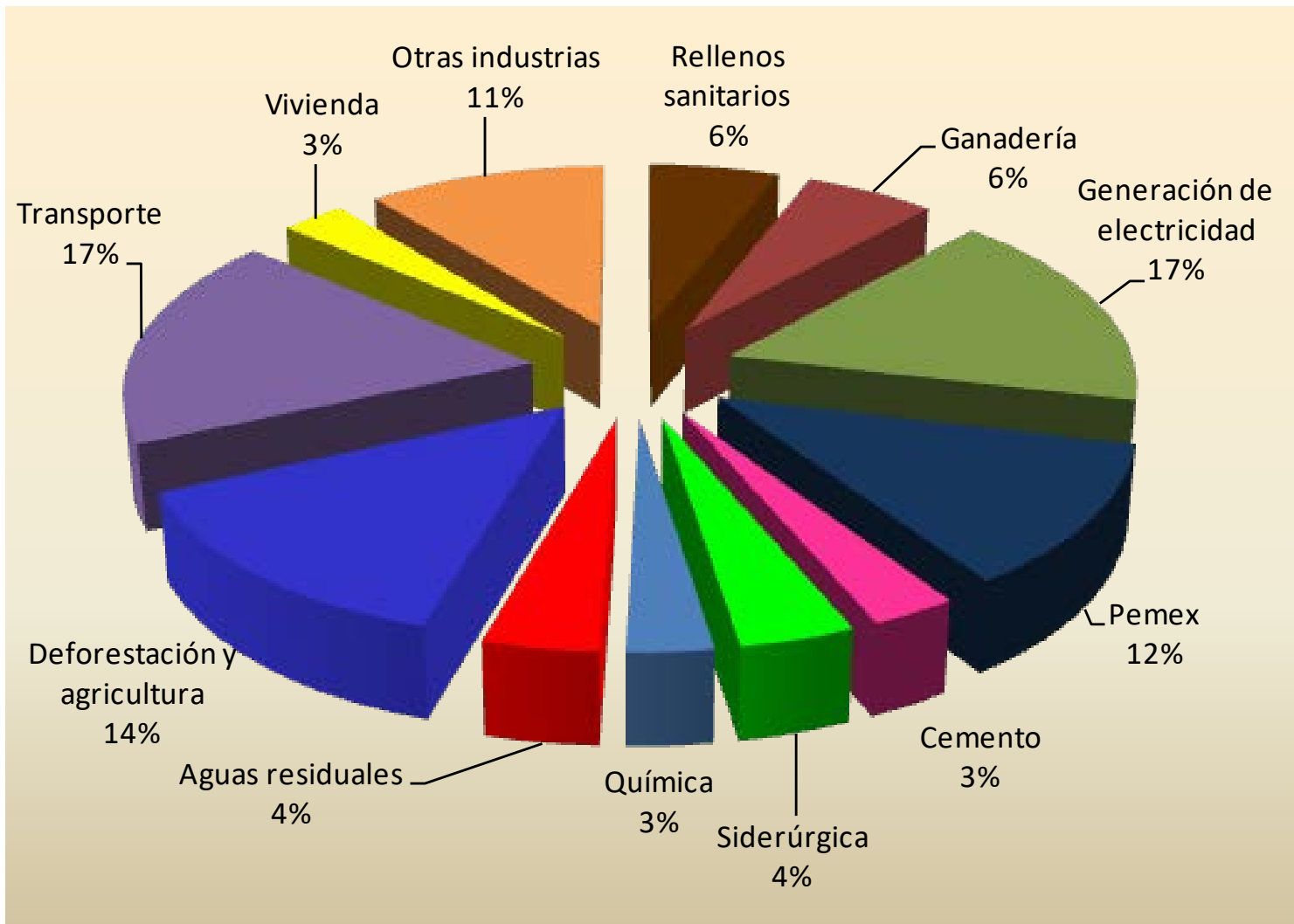
EMISSIONS AND GROWTH RATES



* incluye emisiones asociadas con la deforestación y los cambios de uso de la tierra
Fuente: IEA; EPA; WRI; UNFCCC; McKinsey Analysis.



NATIONAL INVENTORY OF EMISSIONS 2002



Note: emissions from electricity generation are explicit, hence, indirect emissions from industry, services and residential are eliminated



NOTES ABOUT THE INVENTORY OF EMISSIONS

- It is dominated by transport, electricity, deforestation, Pemex, and small and medium sized industries.
- Large industry (cement, steel, chemicals) has generally high energy efficiency due to high energy prices and competition from abroad
- There are considerable methane emissions from Pemex, landfills, farms and waste water treatment plants (WWTP).
- Emissions from vehicles (transport) observe the highest growth rates (4-5% per year, before the crisis) in line with gasoline consumption. Methane from WWTP grows also at a rapid pace.



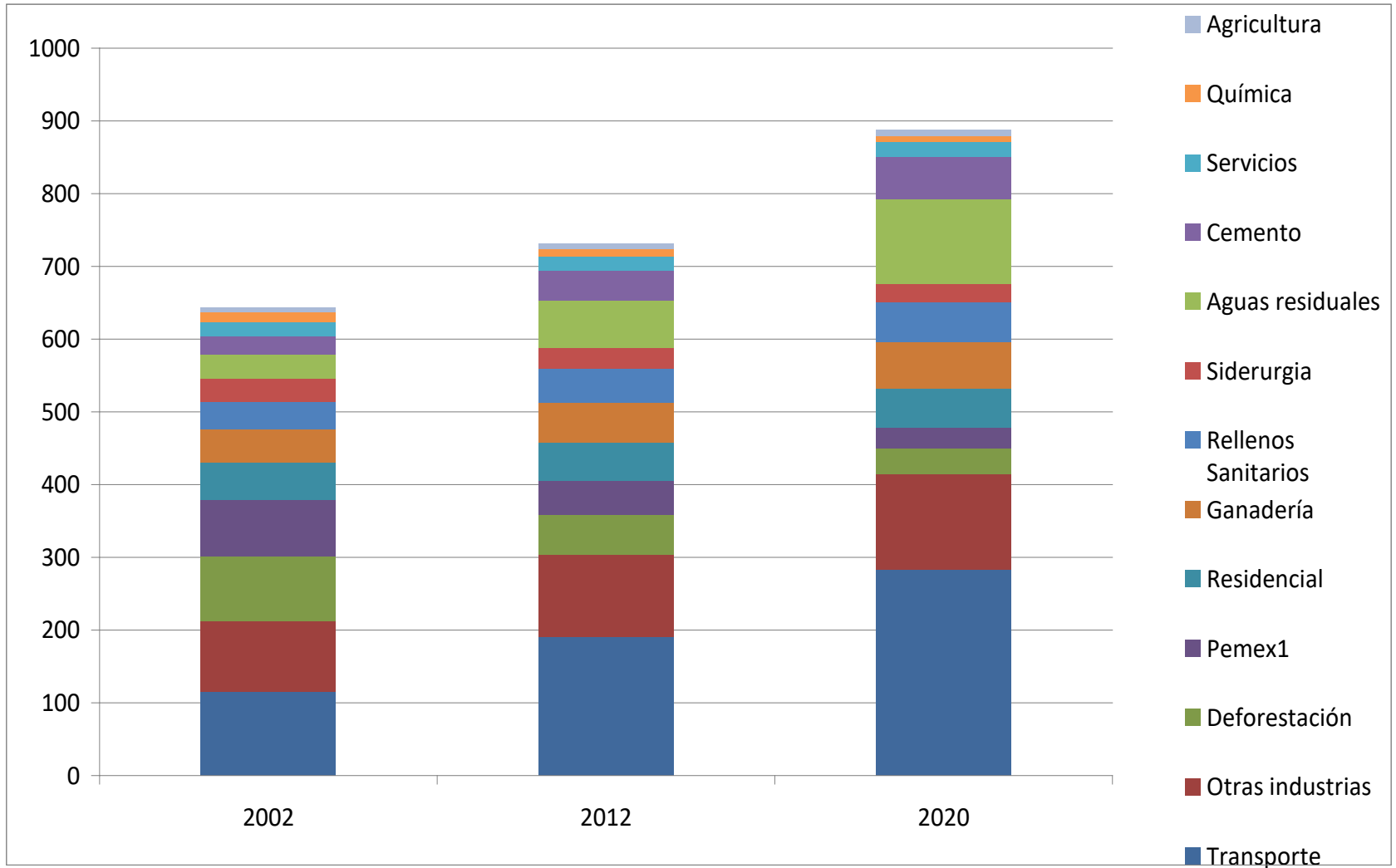
ELECTRICITY GENERATION: BASELINE EMISSIONS 2020

Tipo de planta	Generación de electricidad 2002 GWh	Generación de electricidad 2006 GWh	Generación de electricidad 2012 GWh	Emissiones 2012	Generación de electricidad 2020 GWh	Factor de emisiones por tipo de planta (tCO2/GWh)	Emissiones 2020 Millones de ton CO2
Combustoleo y otras	79,300	51,931	51,931	41.7	25,965	802.05	20.8
Dual	13,879	13,876	13,876	9.9	13,876	715.86	9.9
Ciclo combinado	31,284	91,064	130,980	75.1	200,000	573.00	114.6
Turbogas	6,369	1,523	500	0.4	500	846.47	0.4
Combustión interna	552	854	854	0.6	854	697.99	0.6
Carboeléctrica	16,152	17,931	17,931	18.1	36,000	1006.82	36.2
Hidroeléctrica	23,715	30,305	34,000	0.0	34,000	0.00	0.0
Nucleoeléctrica	9,747	10,866	10,866	0.0	10,866	0.00	0.0
Geotermoeléctrica	5,397	6,685	6,685	0.0	6,885	0.00	0.0
Eólica	0	45	1,051	0.0	3,496	0.00	0.0
Autoabast/cogen	2,176	9,869	19,738	5.9	39,476	300.00	11.8
TOTAL	188,571	234,949	288,412	151.6	371,918	491.0	194.5
Factor de emisión Ton por GWh				525.7			522.9



BASELINE EMISSIONS TO 2020

Business as usual projections



Note: emissions from electricity generation are implicit



NOTES ABOUT THE BASELINE TO 2020

- Transport is projected to become the largest emitter (30%) in 2020.
- Emissions from deforestation diminish, so those from Pemex
- Emissions from WWTP grow absolutely and relatively
- Emissions from cement plants grow due to increased production; however the industry is much advanced technologically.
- The rest of the sectors more or less keep their relative share
- Emissions from electricity generation grow in line with electricity consumption (3%). Emissions factor remains approximately constant (0.5 ton CO₂/Mwh)

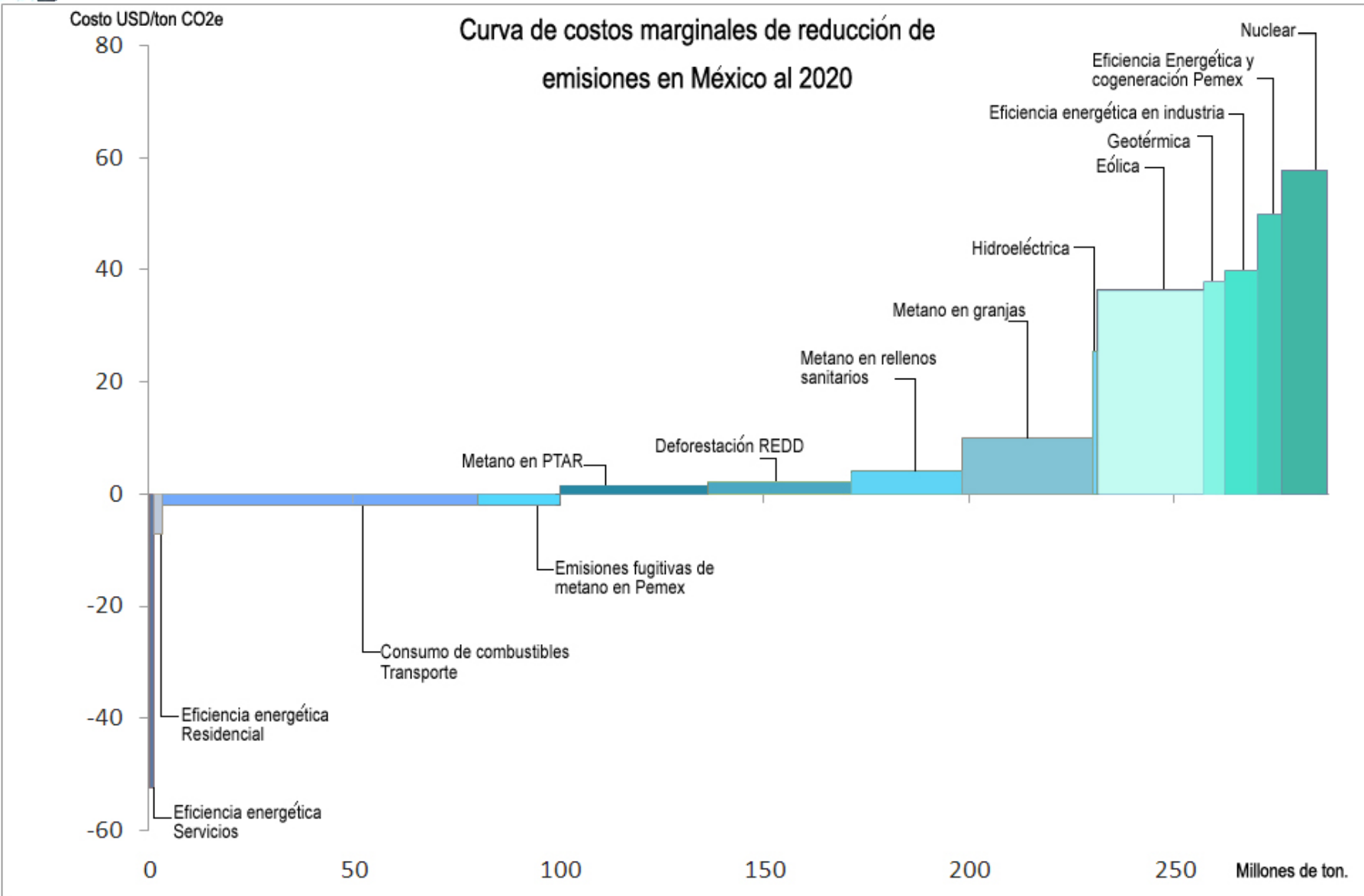


CRITERIA FOR EMISSIONS REDUCTIONS IN LARGE EMERGING ECONOMIES (..... México)

- IPCC points to 450 PPM as a reasonably safe CO₂e concentration (increase of 2 – 3 °C)
- Which implies:
 - a) Annex I countries reduce emissions around 40% in 2020 and 90% in 2050 (1990 base);
 - b) Large emerging and OCDE economies reduce 30% below 2020 baseline



MÉXICO: EMISSIONS REDUCTIONS COSTS



SOURCE: Own estimations, IPCC, EPA, McKinsey, Vattenfal



NOTES ABOUT COSTS AND OFFSETS OPPORTUNITIES

- Least costs are in energy efficiency in services and housing, however, volumes are very limited.
- The largest reduction potential is in transport (gasoline consumption). Costs are quite low and even negative (fiscal - subsidies, externalities)
- Large low cost methane emissions reductions in Pemex, landfill, WWTP and farms.



- REDD offers obvious large emissions reductions opportunities (zero deforestation). Very low cost, probably negative if external benefits are counted (biodiversity, watersheds, landscape, other environmental services)
- Indispensable (but relatively high cost) renewable electricity generation to reduce emissions in the energy sector and indirect emissions in industry, services and housing. Emissions factor could go down to aprox 0.3 ton CO₂/Mwh)
- Energy efficiency in industry and cogeneration are needed, however they are apparently costly due to high capital costs

REDUCTIONS OF EMISSIONS IN ELECTRICITY GENERATION



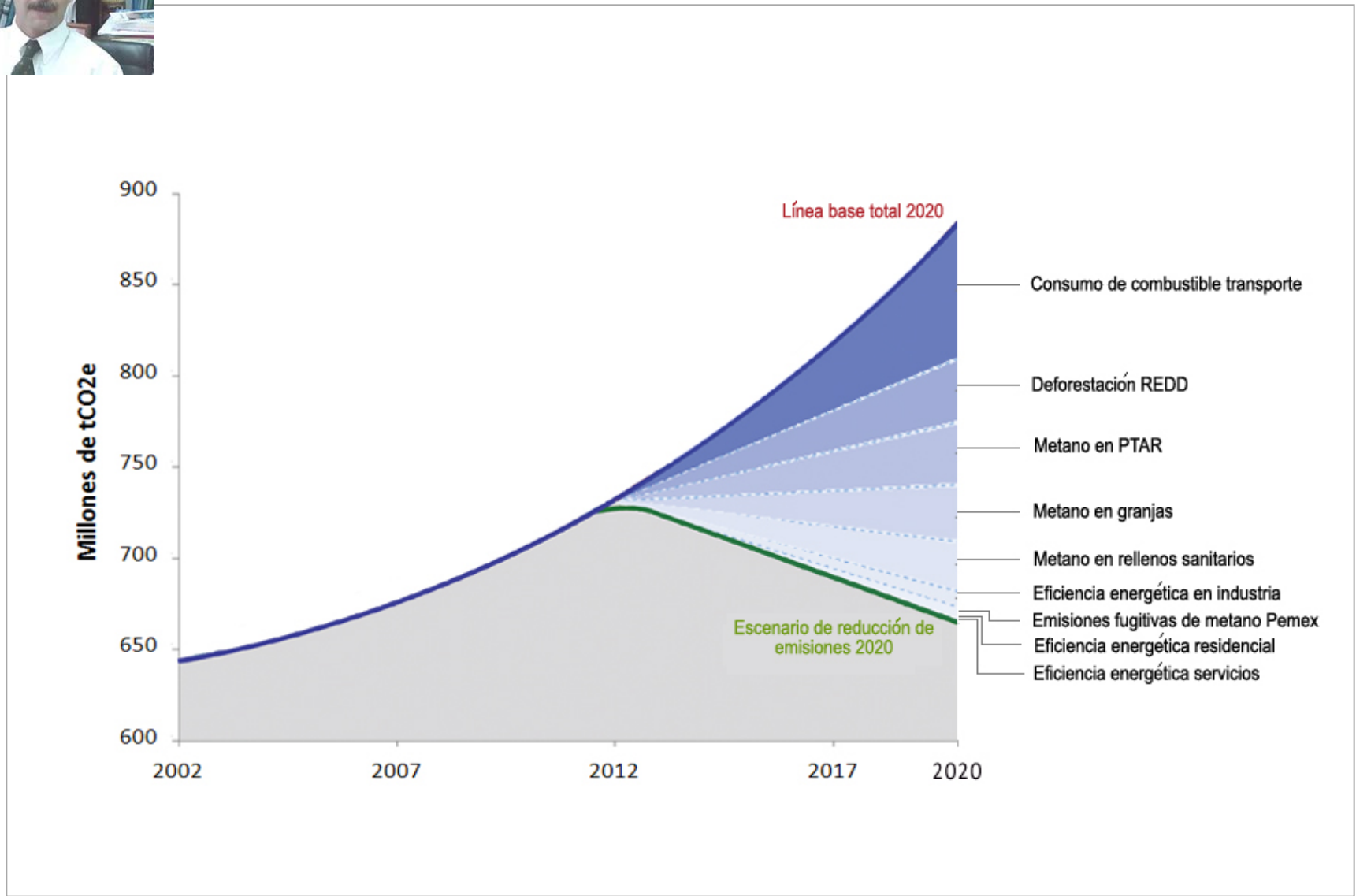
EMISIONES CO2e 2012, 2020 SISTEMA ELÉCTRICO NACIONAL

Escenario de Reducción de Emisiones

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Factor de emisión Ton por GWh				525.7			372.6



EMISSIONS REDUCTIONS SCENARIO 2020 (30%)



Emissions from electricity generation are not explicit and would be additional



MÉXICO: VIABLE COMMITMENTS OR POLICY GOALS FOR 2020

- Much lower growth rates in gasoline demand (5 – 1%)
- Zero deforestation in 2020
- Large reductions in fugitive emissions at Pemex
- Large reductions of methane emissions in landfills, WWTP and farms
- Emissions factor abatement in electricity generation (0.5 – 0.3): wind, hydro, geothermal, maybe nuclear, new coal is canceled, fuel oil retirement, plus more cogeneration and self-generation in industry
- Energy efficiency in housing, services and small and medium sized industry.



POLICY INSTRUMENTS AND FINANCING

SECTORES	INSTRUMENTOS DE POLITICA	FINANCIAMIENTO
Transporte	<ul style="list-style-type: none"> Regulaciones o NOM de CO2 por Km Eliminación de subsidios y aumento gradual en los precios relativos de los combustibles hasta parámetros internacionales Carbon Tax 	<ul style="list-style-type: none"> No necesario Costo fiscal negativo
REDD deforestación cero	<ul style="list-style-type: none"> Contratos de carbono a costo de oportunidad de la tierra en zonas vulnerables ANP 	<ul style="list-style-type: none"> Recursos CONAFOR Recursos etiquetados Carbon Tax
Energía renovable y cogeneración	<ul style="list-style-type: none"> Feed in tariffs, créditos fiscales Acceso realmente favorable a la red (interconexión, despacho, porteo, respaldo, capacidad) Apertura a la inversión privada 	<ul style="list-style-type: none"> Subsidios cruzados Privado Recursos etiquetados Carbon Tax
PEMEX	<ul style="list-style-type: none"> NOM 	<ul style="list-style-type: none"> Recursos propios
Vivienda	<ul style="list-style-type: none"> Subsidios CONAVI Hipotecas verdes INFONAVIT NMX, NOM 	<ul style="list-style-type: none"> Presupuesto CONAVI Recursos INFONAVIT
Rellenos sanitarios y PTAR	<ul style="list-style-type: none"> NOM 	<ul style="list-style-type: none"> Recursos BANOBRAS
Granjas	<ul style="list-style-type: none"> NOM 	<ul style="list-style-type: none"> Recursos Financiera Rural
Eficiencia energética en industria y servicios	<ul style="list-style-type: none"> NOM 	<ul style="list-style-type: none"> Financiamiento externo Recursos etiquetados Carbon Tax



OFFSETTING MODALITIES

- Caps may be voluntary or mandatory (electricity, Pemex, REDD, WWTP, housing)
- Offsets (carbon credits) below the caps
- If institutional reform in electricity generation (private renewables, access to the grid, feed in tariffs, tax credits) = private offsets
- Free offsets in not capped sectors (CDM like)
- Project offsets
- Offsets from PoA's (programs of activities) in not capped sectors
- Government administered offsets in gasoline consumption, maybe REDD



- REDD offsets: under a national baseline, by project (¿?)
- Private sector offsets in industry. Public/private in landfills, farms
- Domestic cap and trade in industry (¿?) Is it worthwhile?
- National baseline for REDD (avoid leakage). Zero deforestation to 2020





ARGUMENTS FOR A NORTH AMERICAN CARBON MARKET

- Avoid leakage in high energy intensity and trade exposed industries
- Lower cost compliance and efficiency
- Avoid trade distortions and neo-protectionism (border tax adjustments)

HOWEVER

- Need for policy harmonization to avoid competitiveness concerns (sector benchmarks?)
- Give participants (México) new opportunities for reform (energy) and to tackle effectively old problems (deforestation through REDD offsets)
- NAFTA, NACEC, NADBANK would play new roles (market regulations, financing)
- The rules are set (Waxman – Markey). We are rule takers