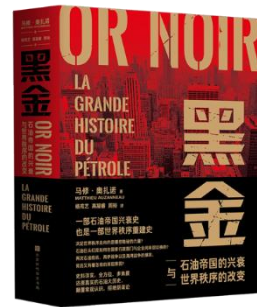
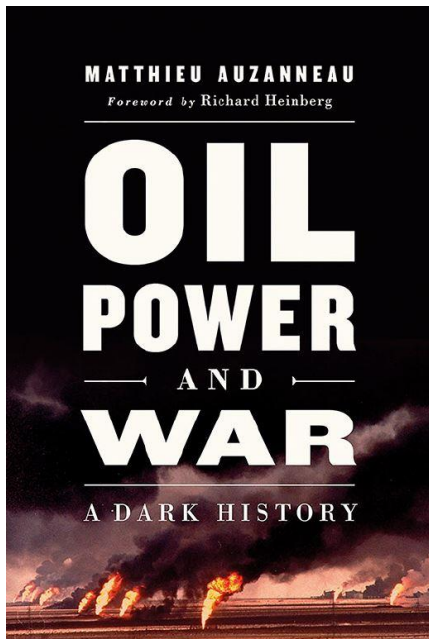
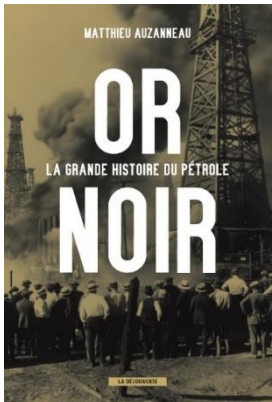
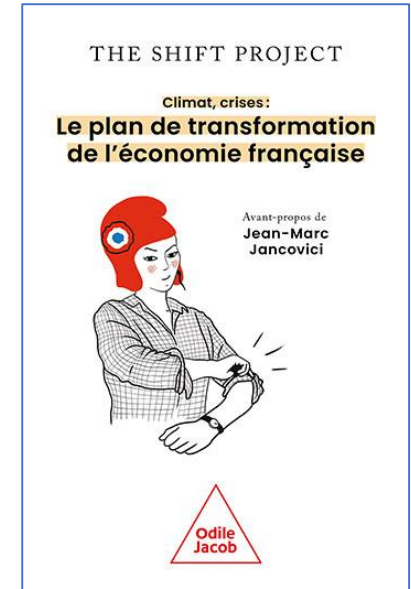




Matthieu Auzanneau
executive director, *The Shift Project*



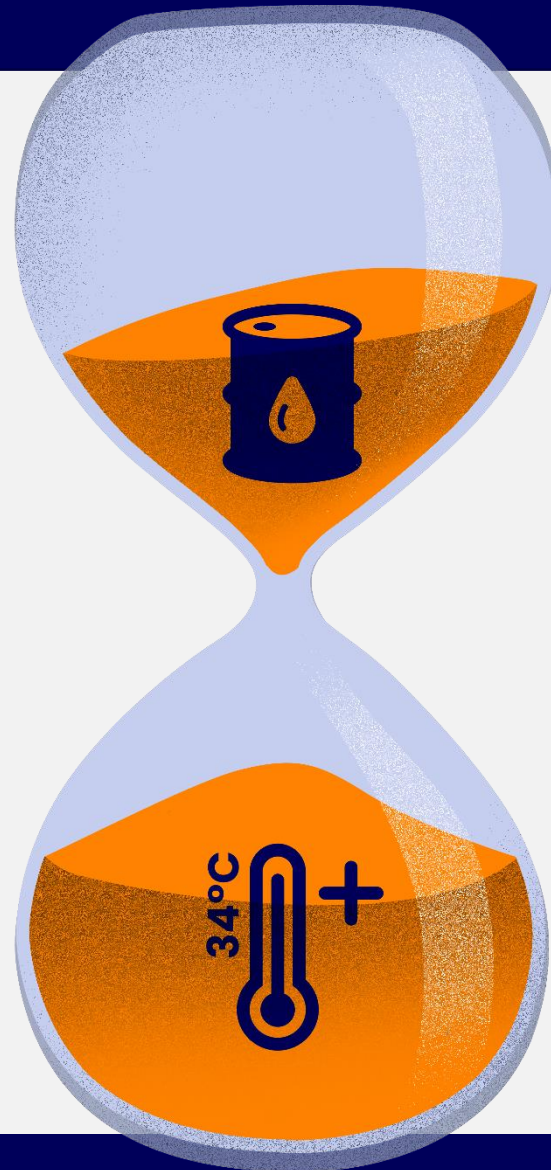
« Or Noir, la grande histoire du pétrole »
« Oil, Power, and War » (2018, Chelsea Green Publishing)

NATURE MAGAZINE “Prodigious”
GEOGRAPHICAL MAGAZINE best book list 2019

The « double carbon constraint »

2- CLIMATE

downstream, **climate change** commits us to reducing greenhouse gases emissions

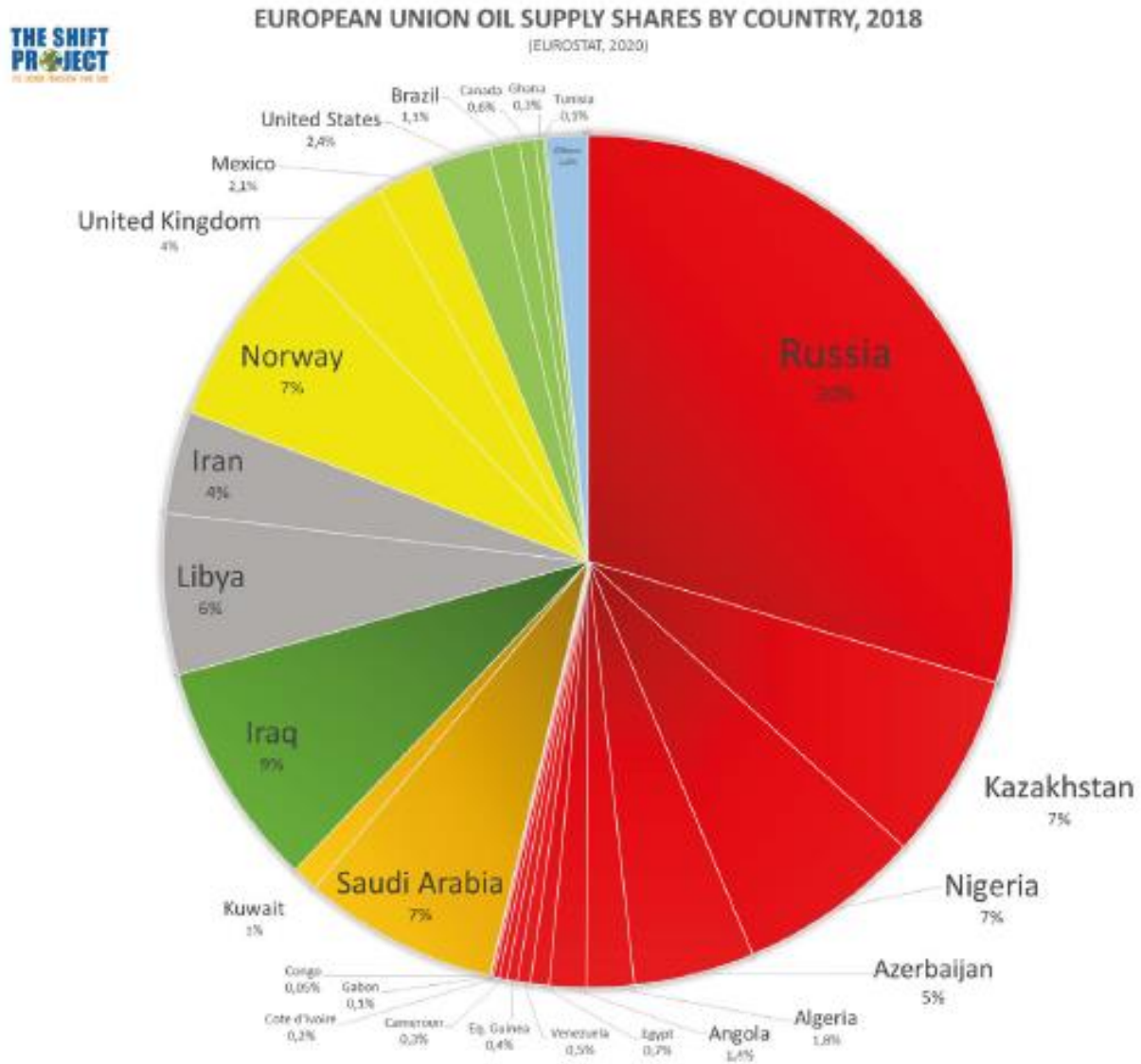


1- ENERGY

upstream side, **the constraint is our stock of energy** : the unavoidable contraction of the fossil supply requires anticipating it

The Second carbon constraint

+50% European union oil imports from mature & depleting oil fields



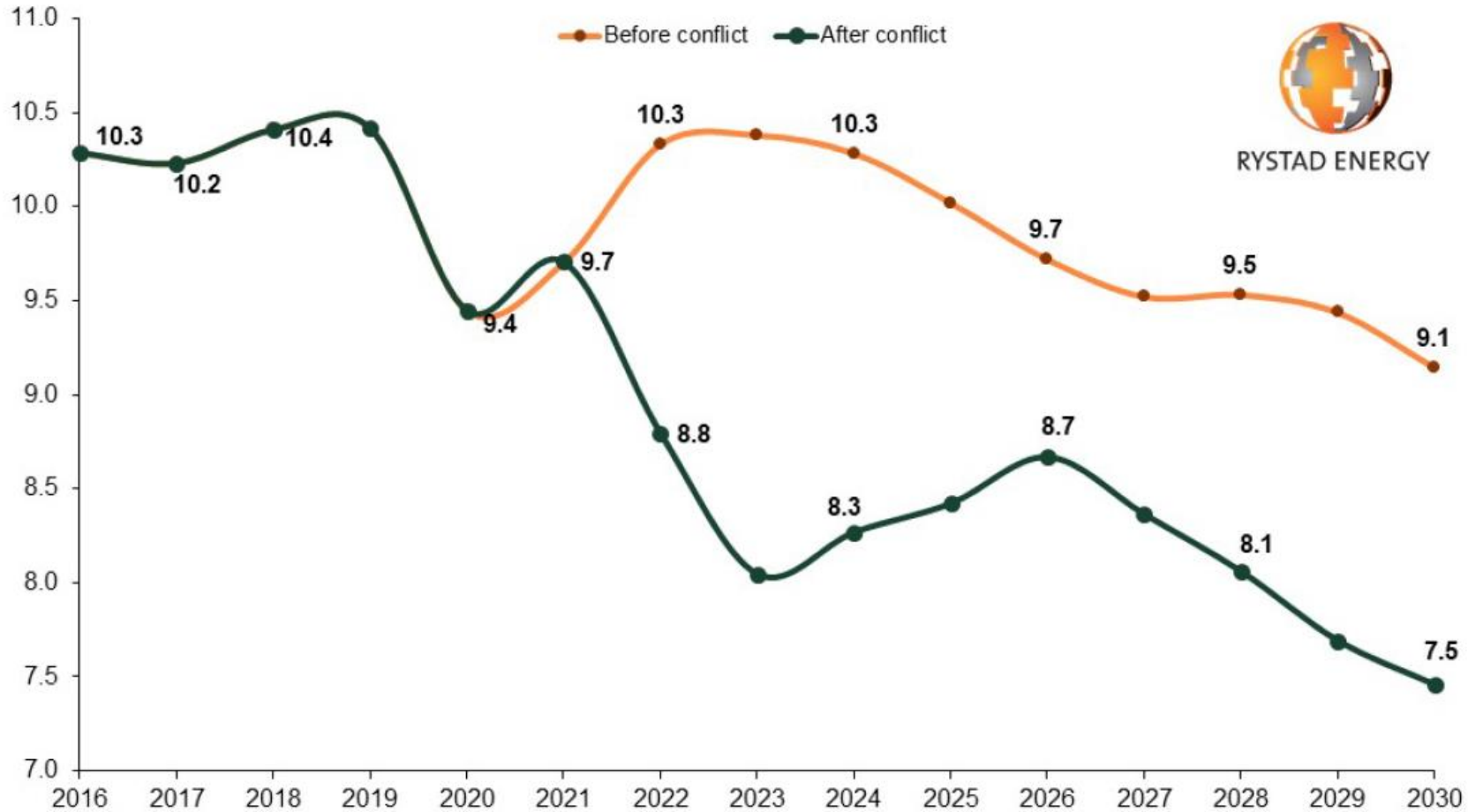
RYSTAD's production forecast 2019 – 2030
& production life cycle appraisal
(June 2020)

Category	Forecast Change
DECLINES – MILD to STEEP	-15%
Russia	-9%
Kazakhstan	-7%
Nigeria	-31%
Azerbaijan	-28%
Algeria	-13%
Angola	-30%
<i>Mostly mature production (> 50% of total output in 2019)</i>	
SOUND & STEADY LEVEL	+3%
<i>mostly relying on fields under development & early producing fields</i>	
<i>Saudi Arabia : 24% of mature production</i>	
<i>Kuwait : 60% of mature production</i>	
SOUND GROWTH Iraq	+25%
<i>mostly relying on early producing fields</i>	
<i>Low mature production share (13% of total)</i>	
SMALL GROWTHS – VERY UNCERTAIN	+11%
<i>within long term capacity decline</i>	
<i>Mostly mature production (> 50% of total)</i>	
<i>Troublesome "above ground" conditions</i>	
SMALL to MEDIUM GROWTHS – UNCERTAIN	+14%
<i>exclusively relying on yet to be developed discoveries</i>	
Norway +16%, UK +18%, Mexico +0.5%	
<i>Overwhelmingly mature production (> 75% of total)</i>	
MEDIUM to STRONG GROWTHS – UNCERTAIN	+34%
US + 27%, Brazil +42%, Canada +16%	
<i>exclusively relying on yet to be developed discoveries</i>	
<i>Fairly high mature production share (> 30% of total)</i>	



Russia crude production outlook before and after invasion of Ukraine

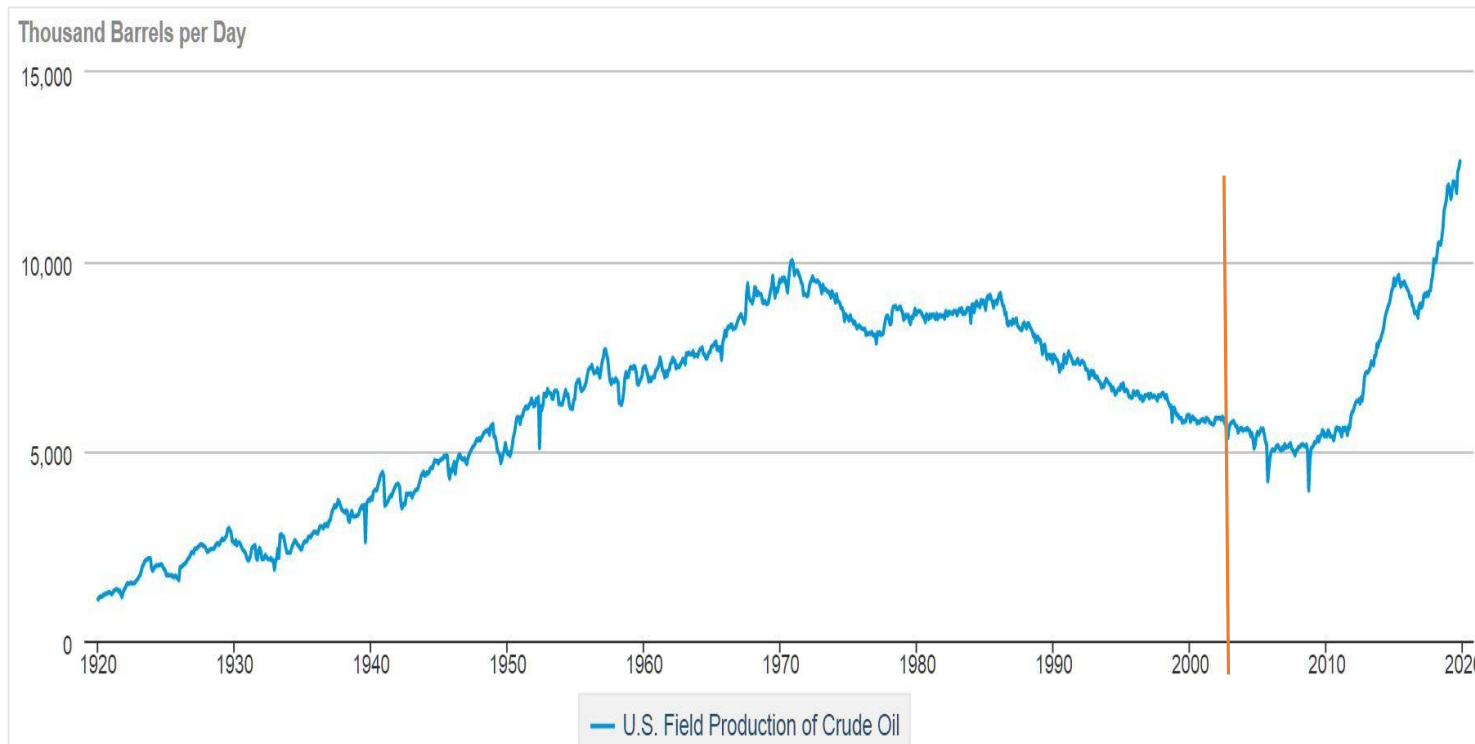
Million bpd



Source: Rystad Energy research and analysis; Rystad Energy UCube

General John ABIZAID, commander of CENTCOM :
« *Of course it's about oil, we cannot really deny it* »

Alan GREENSPAN : « *I am saddened that it is politically inconvenient to acknowledge what everyone knows: **the Iraq war is largely about oil.*** »



Ministry of Oil,
Iraq, 2003

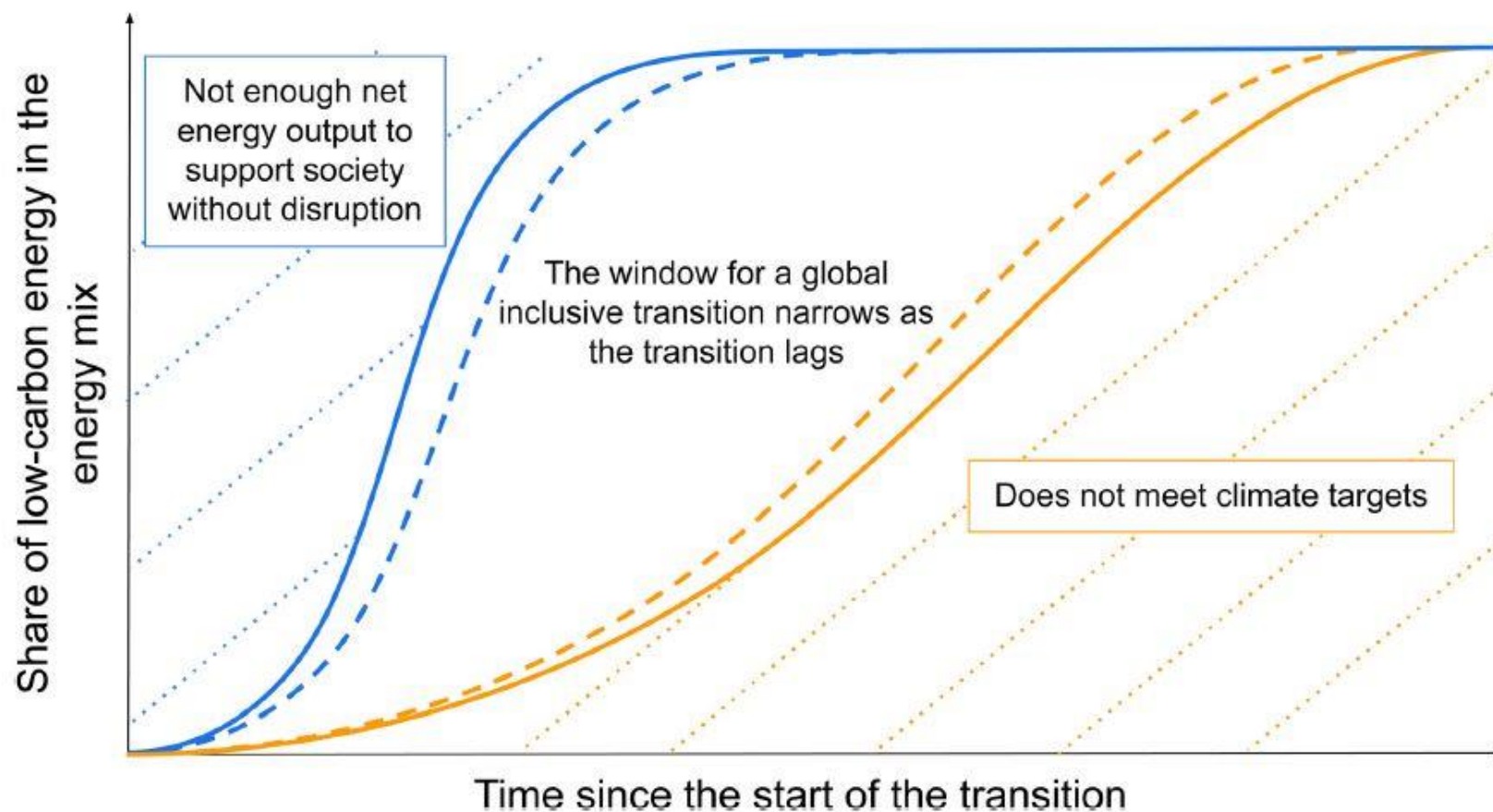


Fig. 3 Sketch of principle of an evolving window of opportunity for the global inclusive transition to low-carbon energy as a function of normalized time at the start of the transition. The solid lines delineate the current window of opportunity. The dashed lines represent a future window in which action has not been taken quickly enough such that climate and net energy increasingly constrain the window of opportunity.

DELANNOY, AUZANNEAU et al.
“Emerging consensus on net energy paves the way for improved integrated assessment modeling”

Energy & Environmental Science,
nov. 2023

Transformation... why such an emergency?

The physical constraints triangle

Structural sufficiency
(or « sobriety »)
as an historical choice without regret

