

# Energy Crisis – turning chaos into opportunity

## Croatia's chance

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# Global Full-Blown Energy Crisis

- Skyrocketing Energy prices
  - Full impact not yet passed onto consumers
  - Renewable Energy is expensive
    - Base load capacity – not provided by solar and wind
      - Always requires backup for base load
    - Geothermal and other renewables are expensive
      - At times 2 to 4 times more expensive
- Skyrocketing Energy demand
  - Oil and Natural Gas demand exceeding pre-COVID levels
  - Lack of investment in oil and gas E&P
  - Strategic Petroleum Reserve releases ineffective

“Wholesale gas prices in Europe ... are more than six times higher than a year ago.”



A screenshot of the Wall Street Journal's Opinion section. At the top, there is a hamburger menu icon, the text "WSJ | OPINION", and a "Read the Latest" link. Below this, there are two article teasers: "DISNEY GOES FOR WOKE" and "APOLOGIES FOR HUNT".

OPINION | REVIEW & OUTLOOK

## *Russia's Energy Extortion of Poland and Bulgaria*

With more U.S. help for Europe, the play could boomerang on Vladimir Putin.

By [The Editorial Board](#) [Follow](#)

April 27, 2022 7:06 pm ET

# Is resulting in chaos

“According to the European Commission, before the pandemic outbreak, at least 34 million Europeans could not heat their homes adequately in the winter ...”

**Some estimates say that number could be 2 or 3 times higher now and become could be worse next winter.**

- Blackouts/Brownouts/Electricity grid collapses
  - Solar and wind do not provide base load capacity
  - Electrical infrastructure requires massive upgrades
    - Will take decades
- Energy Poverty and Insecurity as well as Poverty
  - Inflation
  - Riots
  - Geopolitical tensions, war ...
    - Every country for itself – Italy signed agreements independently
  - Skyrocketing prices of food, fertilizers and other items.
  - Regime change?
- Environmental degradation
  - Deforestation

# And panic

## German court rules bulldozing homes for coal is legal

By Nikolaus J. Kurmayer | EURACTIV.com with CLEW

Mar 29, 2022



A German court has ruled in favour of utility RWE in a dispute over whether bulldozing a village for the sake of mining coal was legal. EPA-EFE/SASCHA STEINBACH

Languages: [Français](#)

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## Balkans turns to coal as energy crisis trumps climate commitments

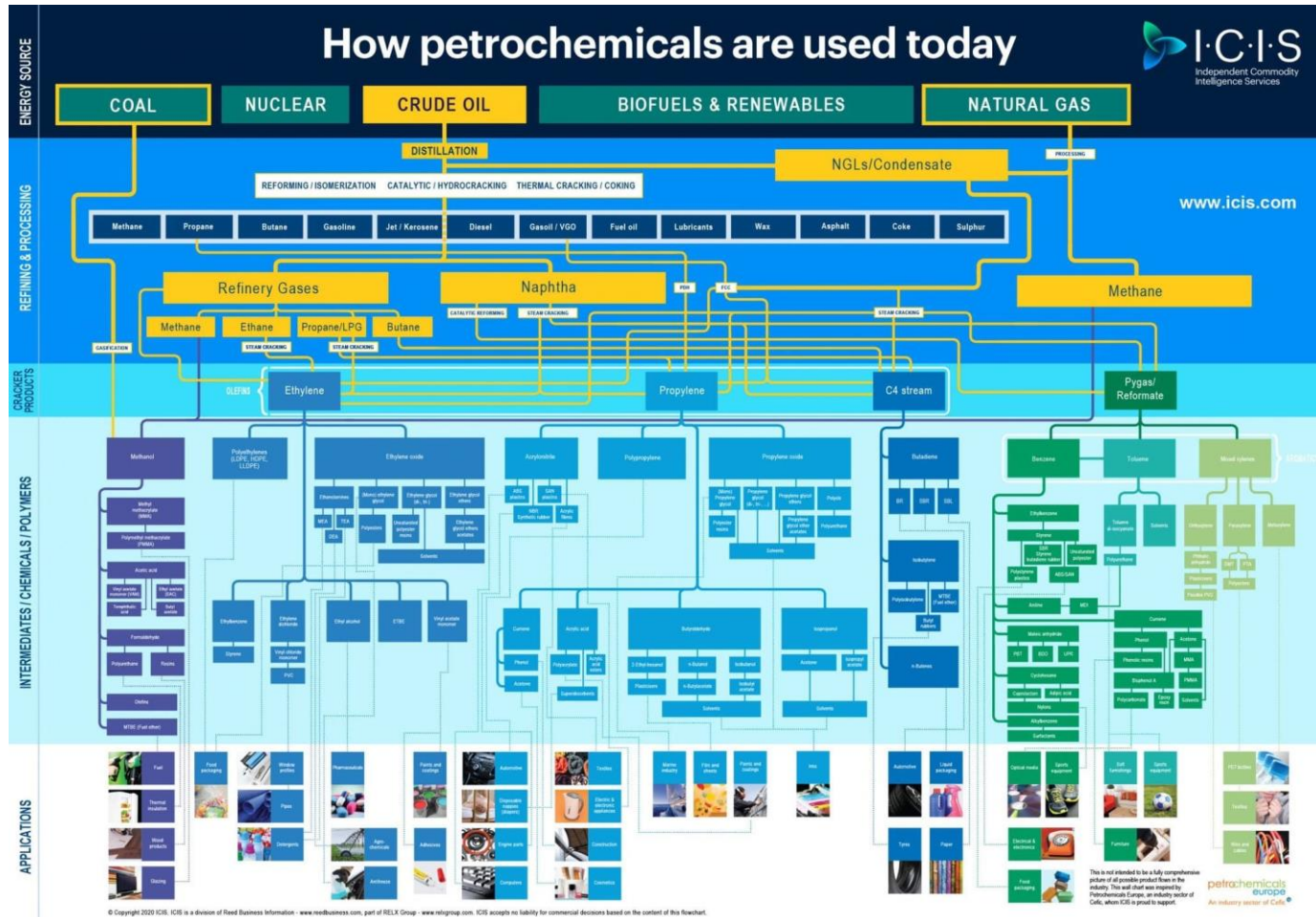
REUTERS | Commodities | Apr 19, 2022 09:06AM ET



© Reuters. People work near the solar plant opposite the coal plant in Oslomej, North Macedonia April 14, 2022. REUTERS/Ognen Teofilovski



# Why – The Perfect Storm



Fuel  
 Thermal insulation  
 Wood products  
 Glazing  
 Food packaging  
 Window profiles  
 Pipes  
 Detergents  
 Pharmaceuticals  
 Agrochemicals  
 Antifreeze  
 Paints and coatings  
 Adhesives  
 Automotive  
 Diapers  
 Engine parts  
 Computers  
 Textiles  
 Electronic appliances  
 Construction  
 Cosmetics

Marine industry  
 Film and sheets  
 Paints and coatings  
 Ink  
 Automotive  
 Liquid packaging  
 Tires  
 Paper  
 Optical media  
 Sports equipment  
 Electronics  
 Food packaging  
 Furniture  
 PET bottles  
 Textiles  
 Wires and cables  
 Soft furnishings  
 Sports Equipment  
**Fertilizer**

# Is there another route forward for Croatia?



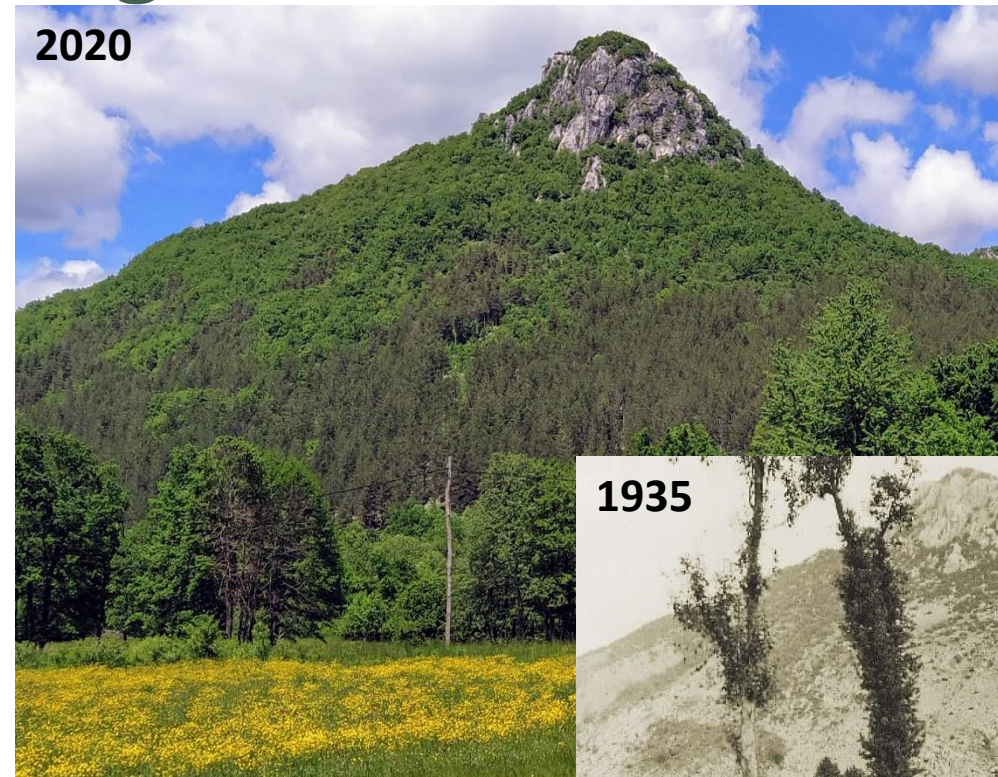
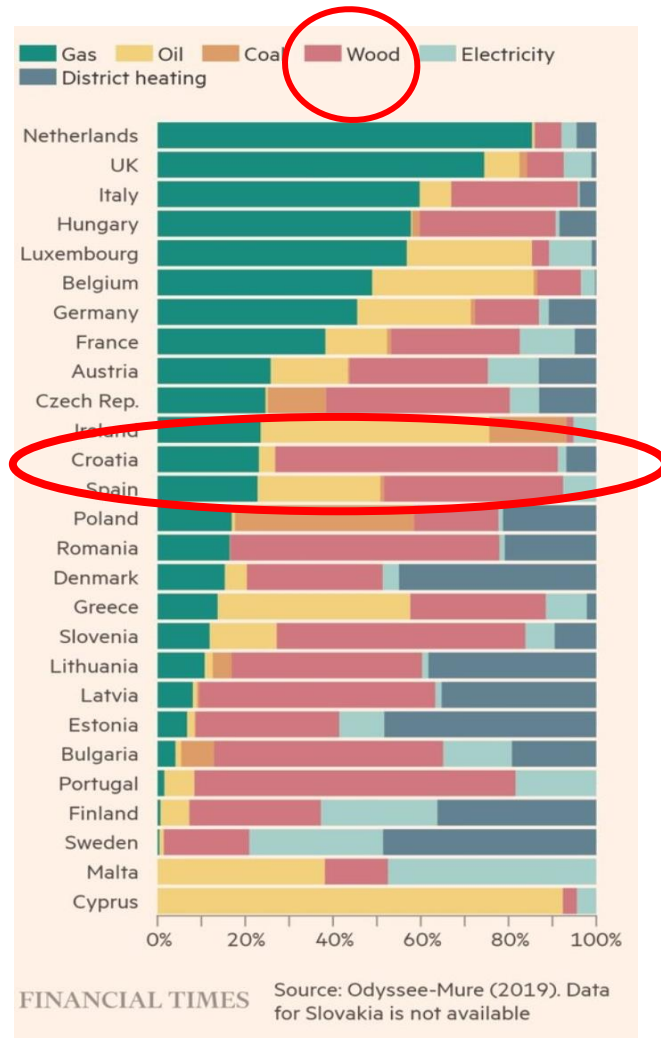
**Yes!**

**There is a lot of  
low hanging fruit**



# A route that will not result in deforestation and environmental degradation

Energy used for residential heating, by source



Mountain Ostrovica, Croatia



Photo Credits: Hrvatske Šume d.o.o.



# A route that will allow Croatia to do a smart energy transition

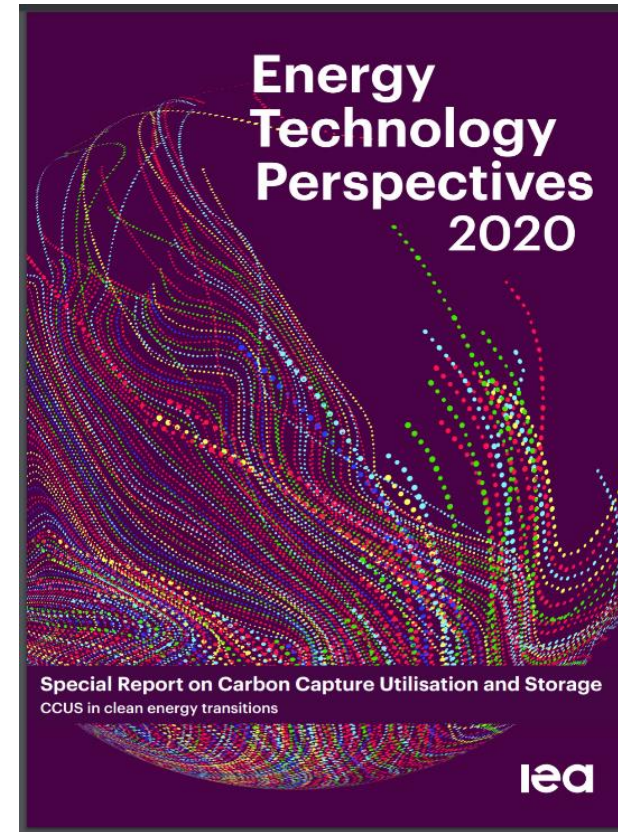
- Protect it's forests, watersheds, waterways and wildlife.
- Subsidize geothermal and non base load capacity - wind and solar
- Expand carbon capture utilization and storage
- Implement E&P emission caps and checkpoints
- Feedstock for hydrogen



Photo from: [www.novolist.hr/rijeka-regija/rijeka/gdje-je-zapelo-sezona-grijanja-je-pred-vratima-a-na-drva-u-rijeci-se-mora-cekati-45-dana/](http://www.novolist.hr/rijeka-regija/rijeka/gdje-je-zapelo-sezona-grijanja-je-pred-vratima-a-na-drva-u-rijeci-se-mora-cekati-45-dana/)

# Why is CCUS important?

- CCUS is an Enhanced Oil Recovery (EOR) method
  - ~500K bpd using CO2 EOR
  - Nearly 70% CO2 captured from O&G operations
- Complementary - store carbon and increase production of hydrocarbons



IEA - “Reaching net zero will be virtually impossible without CCUS”

# A route that will align with EU members

## German finance minister open to new oil, gas drilling in North Sea

Reuters



Source: [German finance minister open to new oil, gas drilling in North Sea](#) | Reuters

NEWS | April 12, 2022

## Greek PM promises offshore exploration expansion

In response to rising energy costs, Greece aims to assess its oil and gas reserves by 2023.

By Matt Farmer



Source: <https://www.offshore-technology.com/news/greece-oil-gas-reserves-exploration-ukraine/>



# Comparison example – German offshore oil production

## Mittelplate details (Wintershall Dea): producing oil

- Produce oil offshore in a National Park
- Seven km from the shore, in shallow water
- Produced over 300 million barrels of oil



Photo from: Wikipedia Mittelplate post

## Why Germany produces their national resources:

- Reliable, efficient and stable supply of energy
- Lower cost – subsidy to industry and residents
- High paying technical jobs
- Tax revenue
- Strong domestic oil and gas industry
- Oil and gas service industry plus export of their products and services
- Stimulation of other industries – hot houses, fertilizer, petrochemical and others

# Deloitte Study – Romanian example

- Estimated Future Economic effects:
  - Tens of thousand of jobs
  - Contribute over 7 billion USD annually
  - Achieved without any new government spending
- Confident same can be multiplied many times throughout CEEC
  - Economic spillover – greenhouses ...

Summary of estimated future economic effects* 2018-2040	
Estimated offshore CAPEX	15.7 billion USD
Estimated offshore OPEX	6.5 billion USD



<b>National Output</b>	<b>71.3 billion USD</b>
<b>Average annual number of employees throughout the period (Cumulated man-years)</b>	<b>30,605 (~ 703,915)</b>
<b>Total state revenues</b> out of which royalty revenues	<b>26.0 billion USD</b> 5.5 billion USD

Summary of estimated future economic spillover effects 2018-2040	
<b>Estimated CAPEX</b>	<b>8.9 billion USD</b>

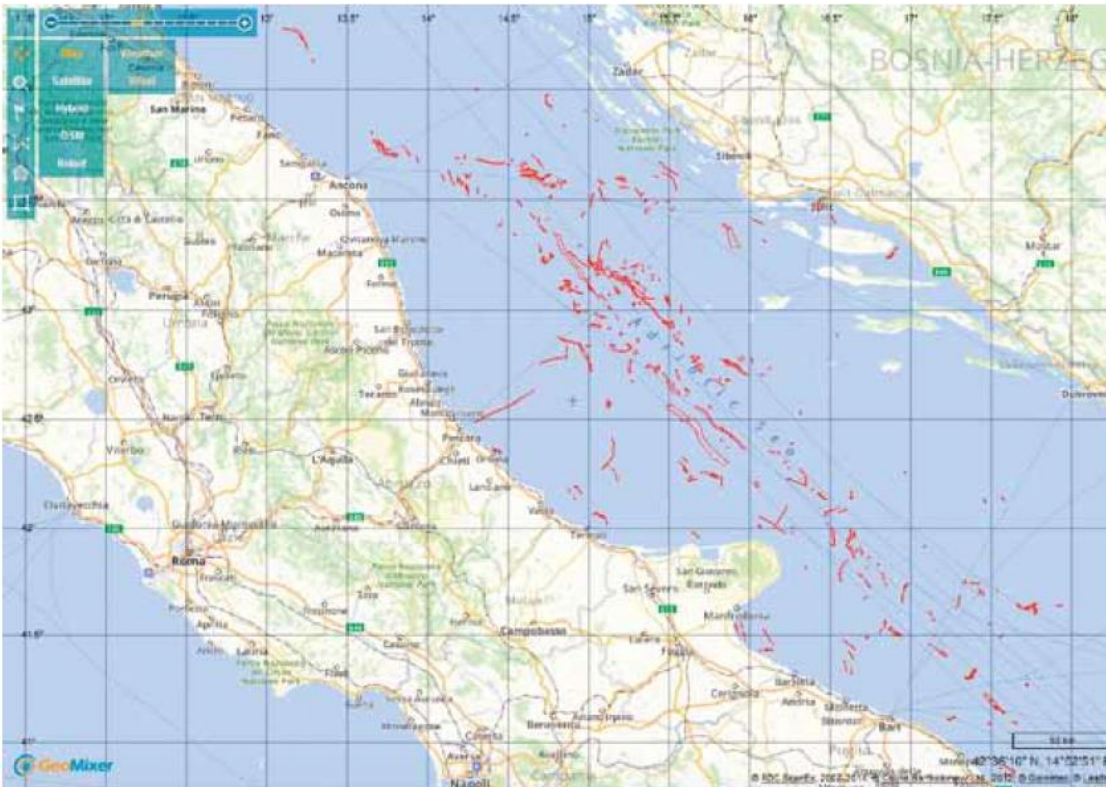


<b>National Output</b>	<b>98.9 billion USD</b>
<b>Average annual number of employees throughout the period (Cumulated man-years)</b>	<b>41,945 (~ 880,845)</b>
<b>Total state revenues</b>	<b>18.3 billion USD</b>

Tables from: "The contribution of Black Sea oil and gas projects to the development of the Romanian economy", Deloitte, May 2018

# A route that will help stop illegal oil dumps

- According to a European Commission study, illegal oil dumps regularly occur in the Adriatic
- Tankers that import oil present the greatest risk to offshore Croatia

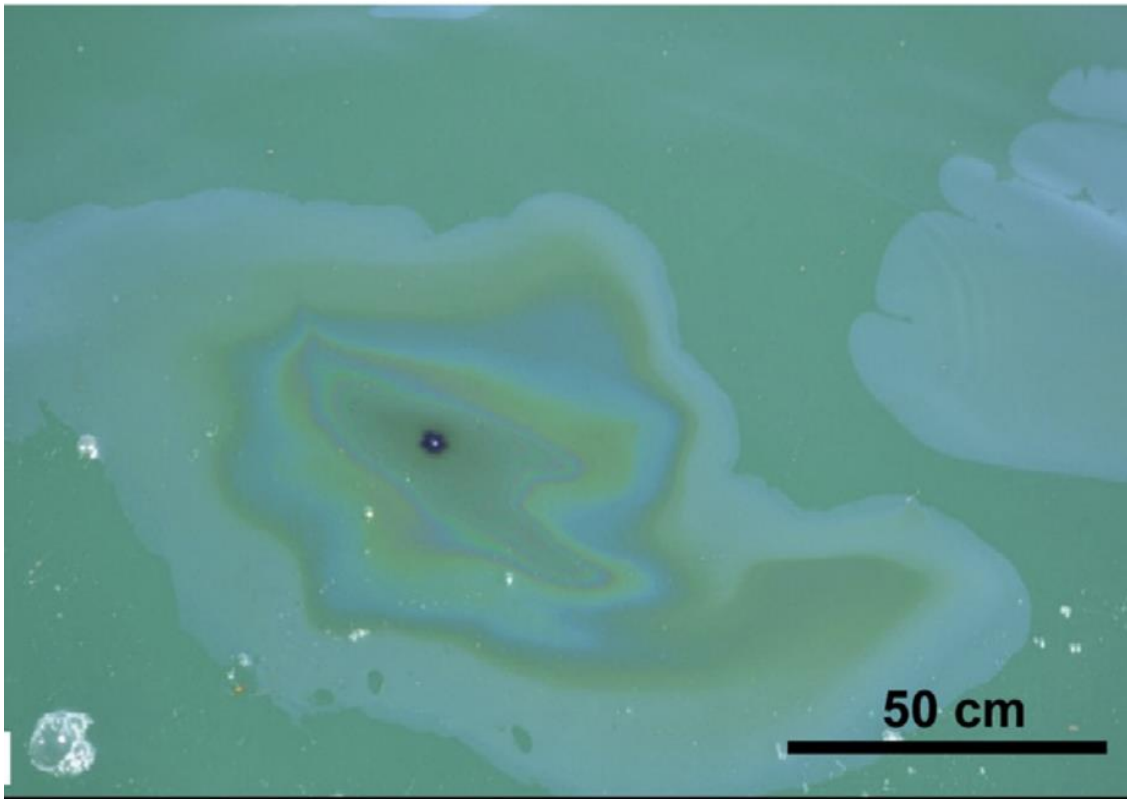


Map from: [hrcak.srce.hr/file/224030](http://hrcak.srce.hr/file/224030)

Radar images of the Adriatic oil slicks. Slicks correlate with main shipping routes

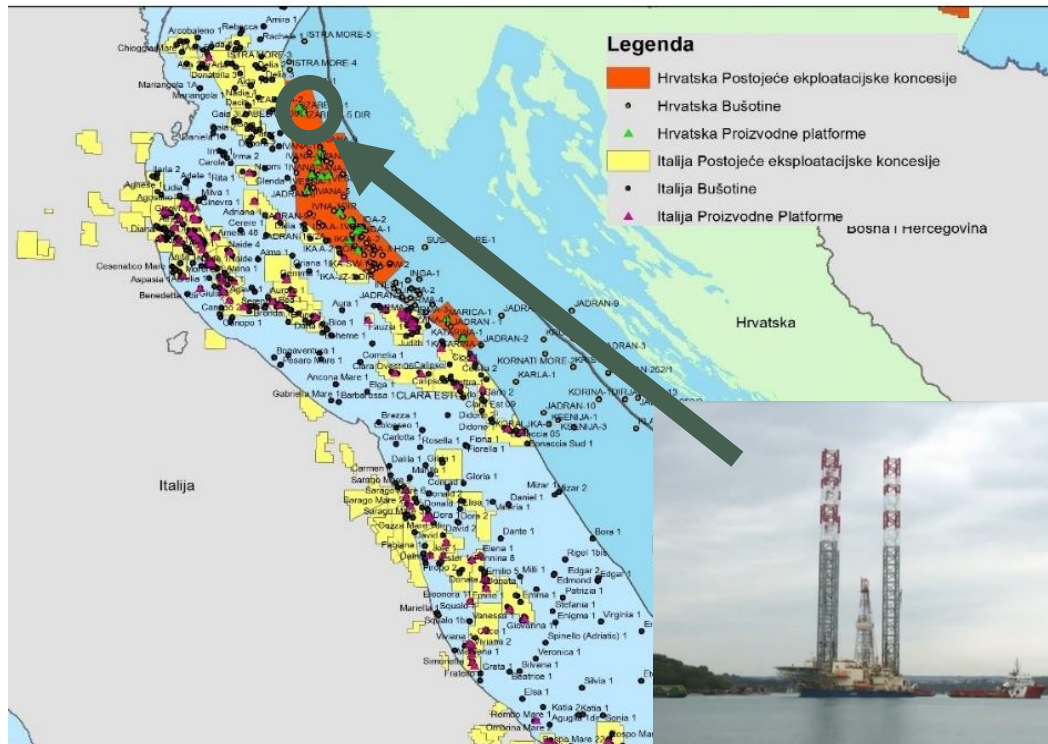


# A route that will evaluate Adriatic oil and gas seeps



- Natural oil and gas seeps occur throughout the Adriatic
- Result is surface oil slicks and gas bubble plumes
- Natural oil seeps have been identified by radar reflectance and optical satellites in the Croatian Adriatic

# Croatia's Chance - It's Offshore Advantaged Hydrocarbons



Map from: <http://www.azu.hr/portals/0/Dokumenti/azu-brosura-2015.pdf>

Screenshot from: <https://m.youtube.com/watch?feature=youtu.be&v=IPbXf4KIaVU>

- Croatia has been producing Adriatic natural gas since 1999
- Italy has produced Adriatic oil and gas for decades
- Existing hydrostatic pressures prevent spills
- Production nearest to Croatia's most successful tourist region - Istra

# Develop Croatia's Offshore Advantaged Hydrocarbons

- 203 offshore leads identified
- Interest exists to explore and produce
- CCUS potential

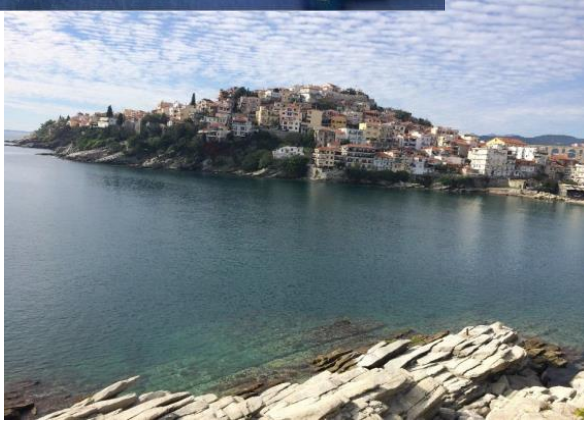




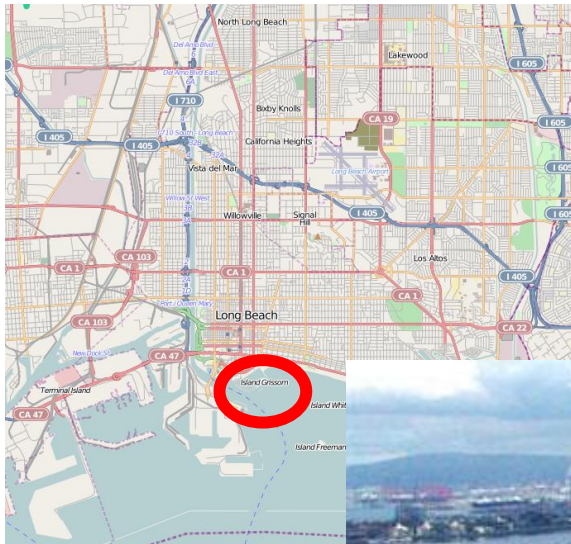
# Greek offshore production – Kavala Bay



- Oil production in the Aegean Sea
- Co-existence of oil production, tourism and fishing
- Oil production stimulates tourism and fishing



# US offshore production – Santa Barbara, Long Beach



**Island Grissom, THUMS Islands, one of the four oil production islands off Long Beach, California**

- The Santa Barbara and Los Angeles regions produce over 100,000 barrels of offshore oil per day.
- Tourism, fishing and offshore oil production successfully co-exist and stimulate each other



Photo from: [https://en.wikipedia.org/wiki/THUMS\\_Islands](https://en.wikipedia.org/wiki/THUMS_Islands)

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**THANK YOU**

