

Natural Gas: Status of Methane Emission Studies – Opportunities & Challenges

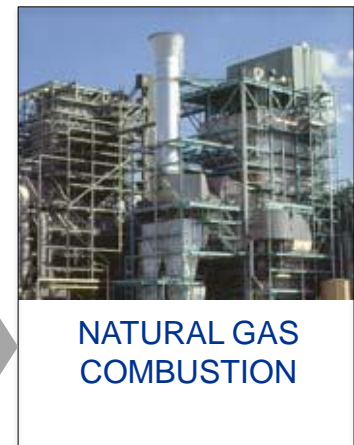
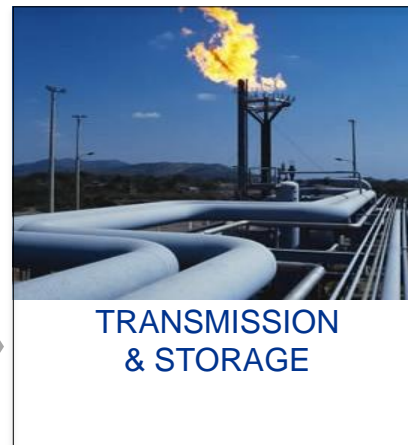
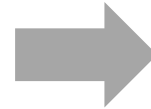
2014 Midwest and Central States Air Quality Workshop

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April 22, 2014



Power plant CO2 isn't the whole story

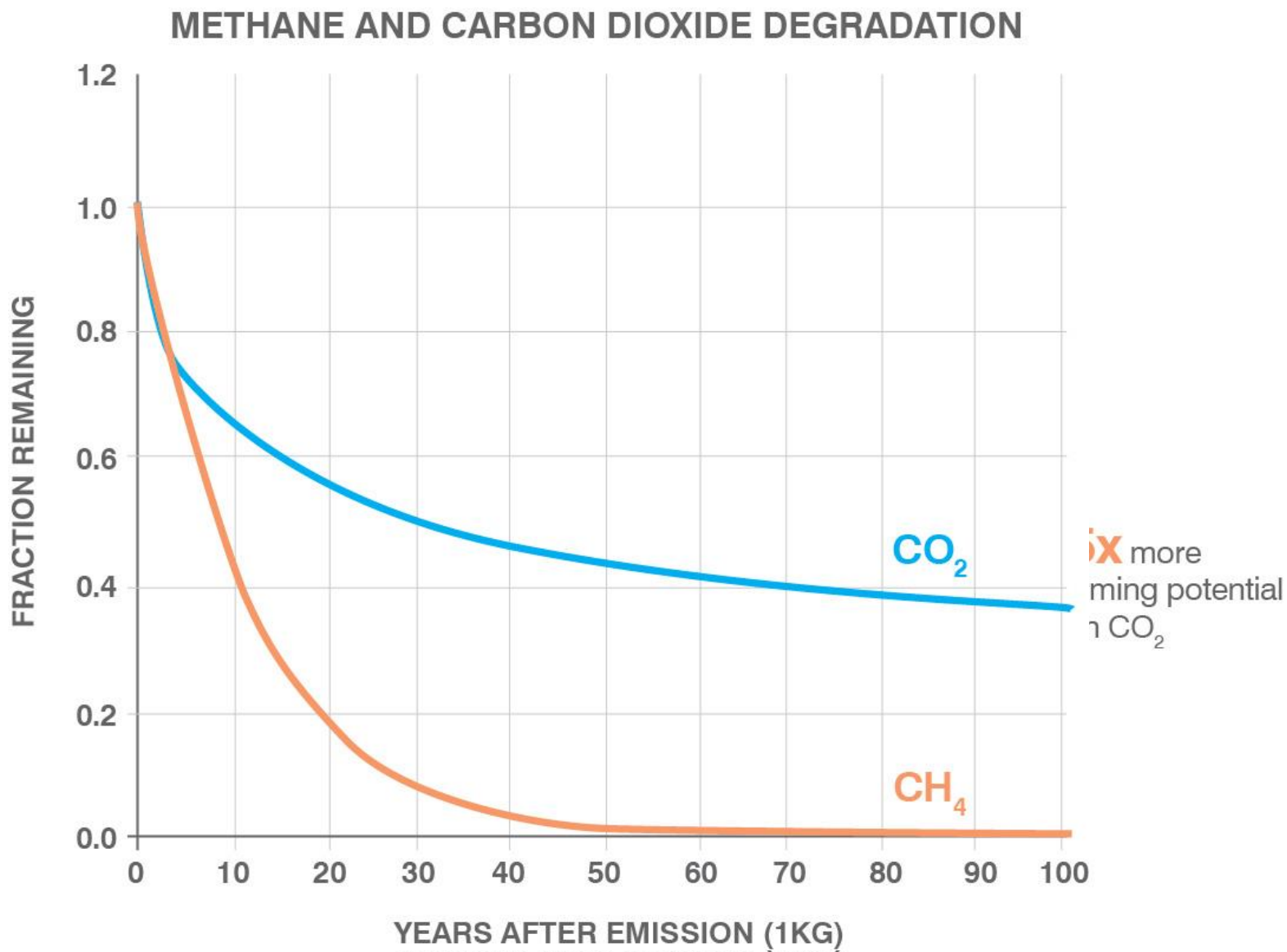


LOCAL DISTRIBUTION TO OTHER END USERS

Methane: The Other Important GHG



Climate implications of methane



EDF methane leakage study modules

Steering Committee report approval dates

Phase 1 – Done
Phase 2 – Spring '14

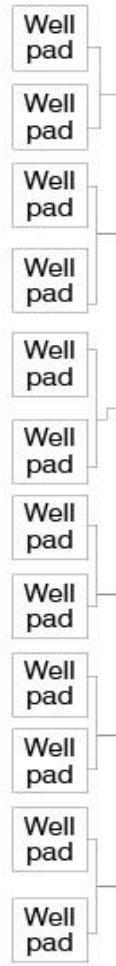
Summer '14

Spring '14

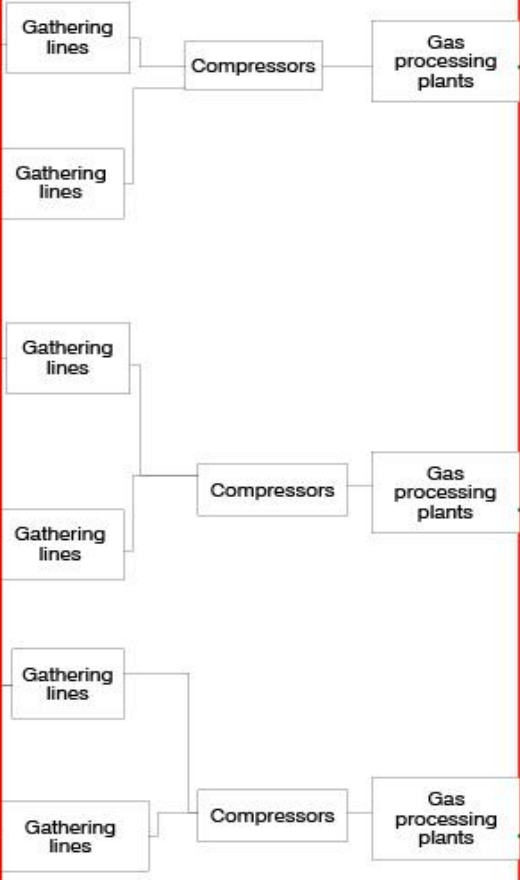
Winter '14

Spring '13

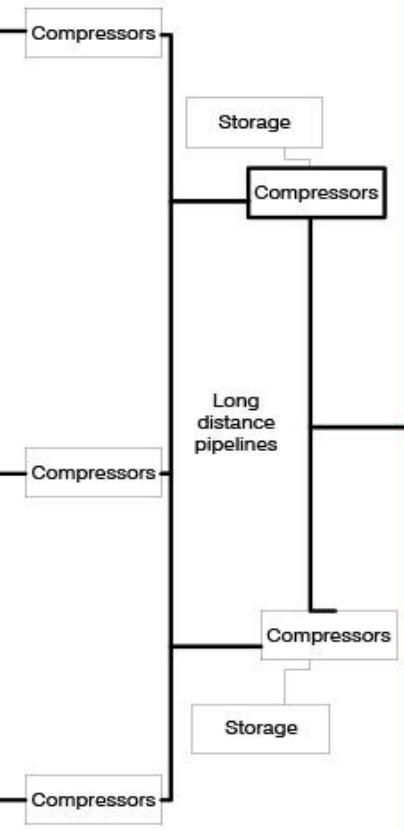
Production module



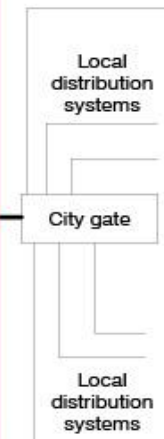
Gathering and processing module



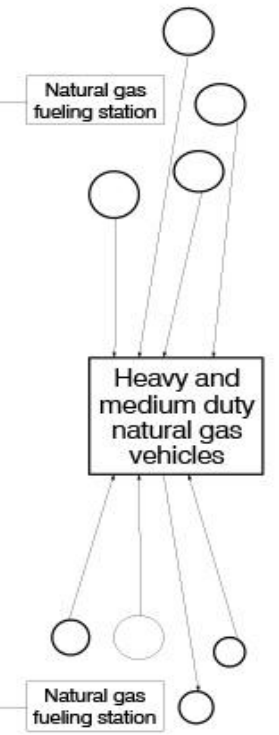
Transmission and storage module



Local distribution module



Natural gas vehicles and fuel stations module



RECENT ESTIMATES OF U.S. NATURAL GAS EMISSIONS

Production

0.53%

(Allen, et. al PNAS 2013)

Gathering / Processing

0.19%

(EPA GHG Inventory 2013)

Transmission / Storage

0.42%

(EPA GHG Inventory 2013)

Local Distribution

0.27%

(EPA GHG Inventory 2013)

Trucks & Stations

0.57%

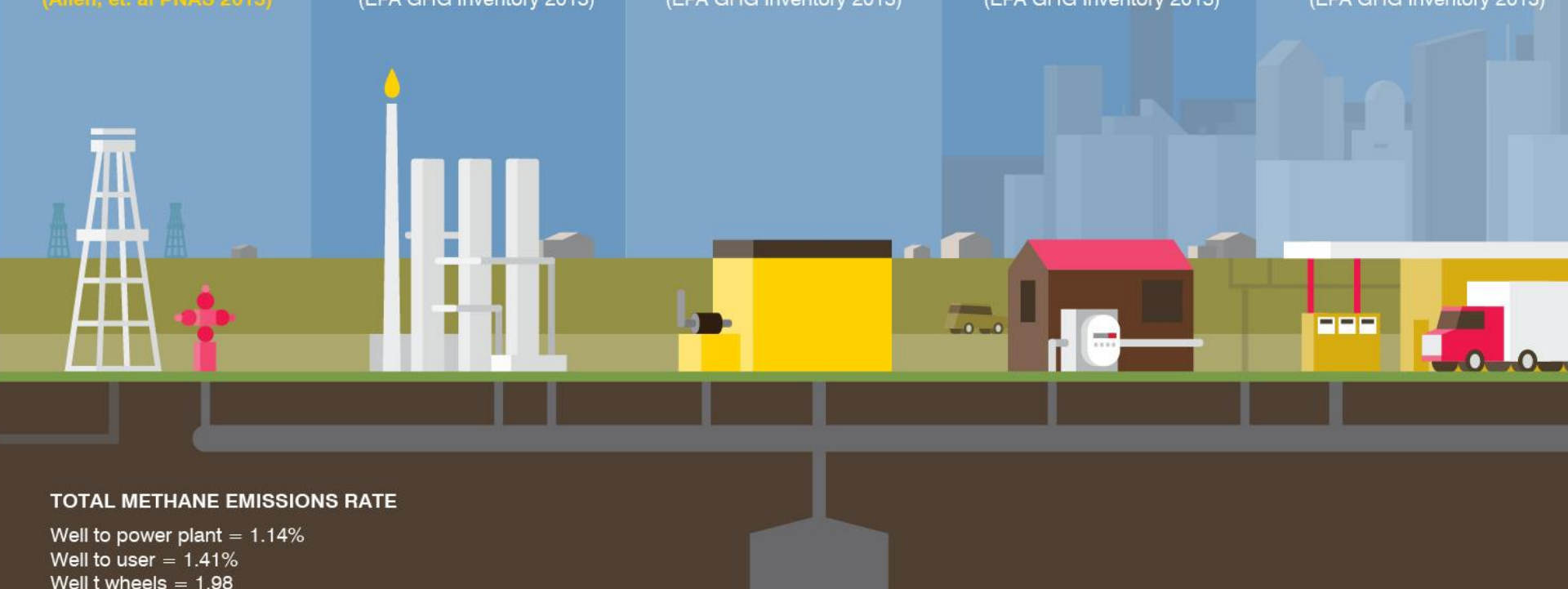
(EPA GHG Inventory 2013)

TOTAL METHANE EMISSIONS RATE

Well to power plant = 1.14%

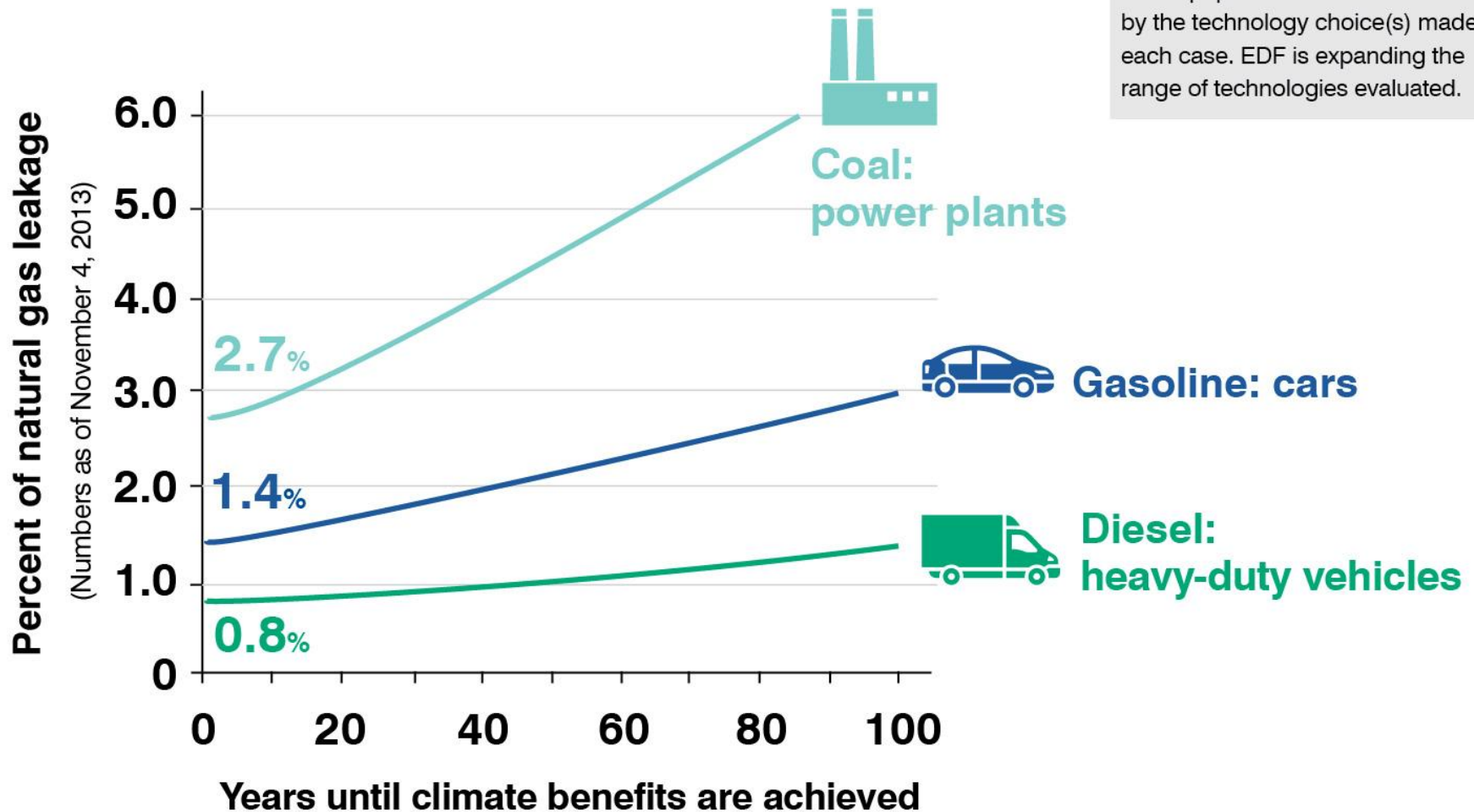
Well to user = 1.41%

Well t wheels = 1.98

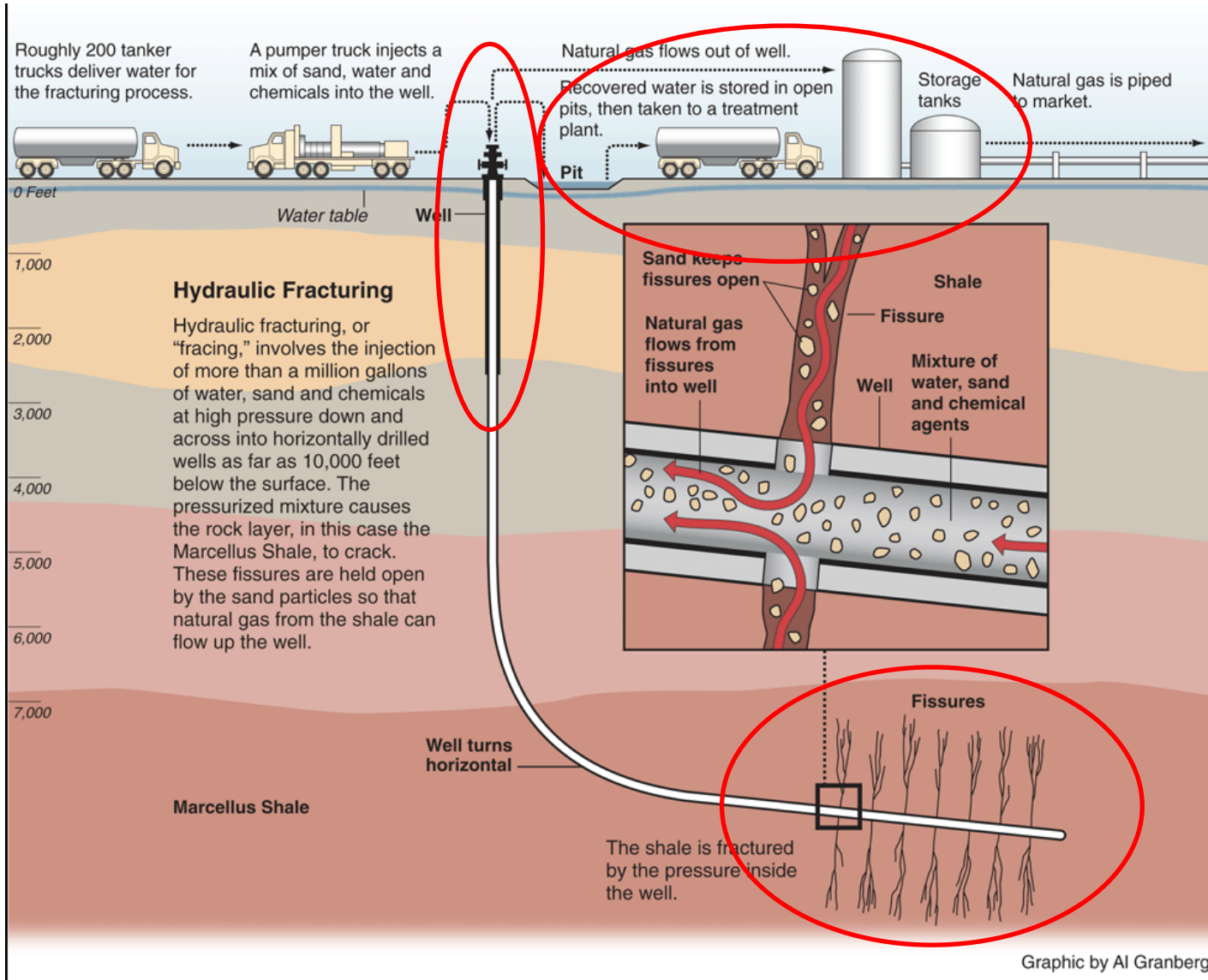


Can Natural Gas Deliver Sustained Climate Benefits?


Updated calculations in EDF's 2012 PNAS paper.* Individual results vary by the technology choice(s) made in each case. EDF is expanding the range of technologies evaluated.



Where the 'fracing' issues really are



Key Risk Management Areas

- **Air Quality**
 - **Disclosure**
 - **Well Integrity**
 - **Water and Waste Management**
 - **Communities and Habitats**
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Thank You!

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