Voluntary Standards in Shale:
Opportunity, Challenges, Solutions

EUCE Conference on Environment & Energy

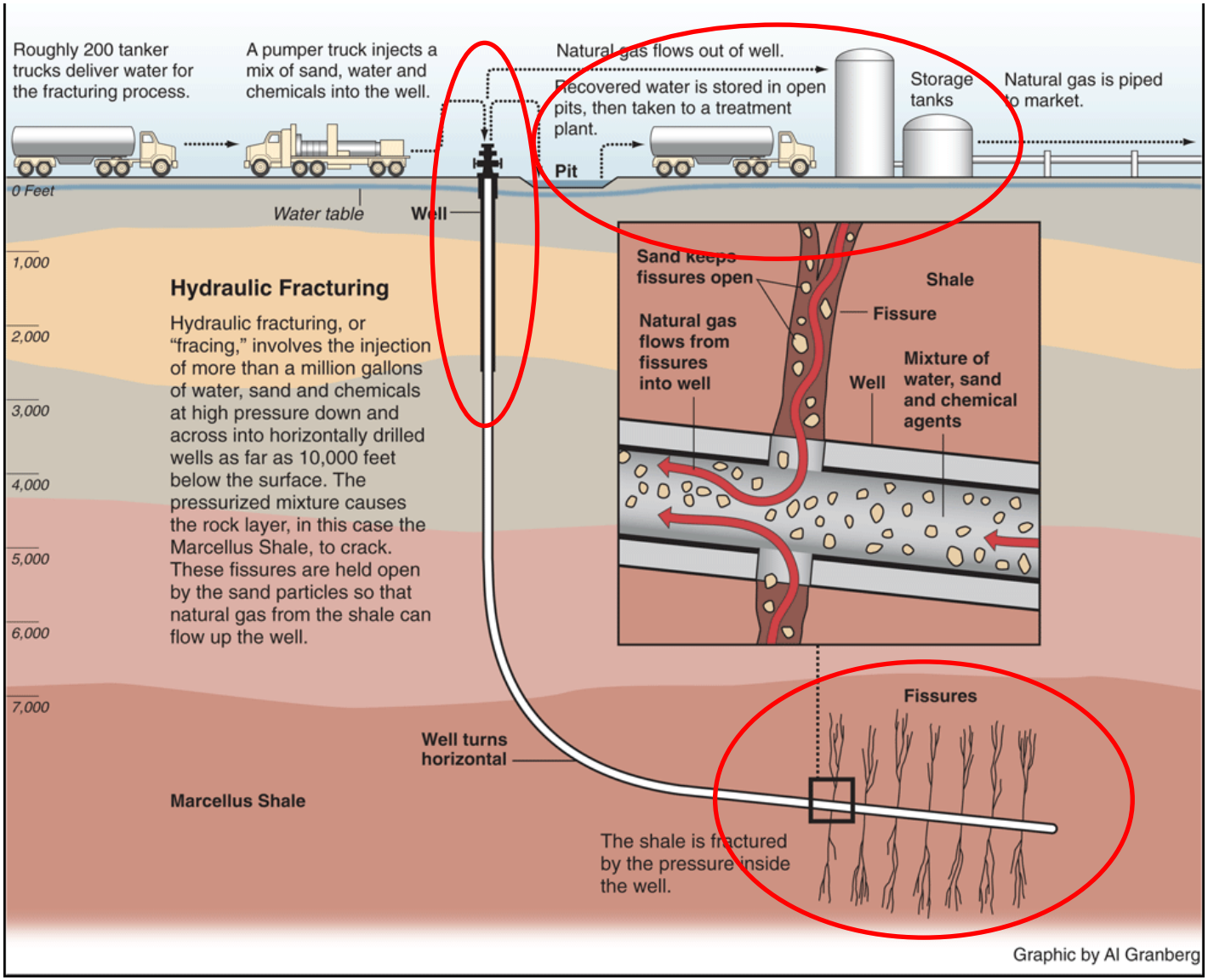
Andrew T. Williams

March 22, 2014

EDF ENVIRONMENTAL DEFENSE FUND®

Finding the ways that work

Where the ‘fracing’ issues really are



Power plant CO2 isn't the whole story

COAL MINING
& PROCESSING

TRANSPORTATION

COAL COMBUSTION

NATURAL GAS
PRODUCTION

PROCESSING

TRANSMISSION
& STORAGE

NATURAL GAS
COMBUSTION

LOCAL DISTRIBUTION TO
OTHER END USERS

Source: Adapted from Jaramillo et al., (2007) EST 41, 6290

Climate implications of methane

Methane Story

EDF ENVIRONMENTAL DEFENSE FUND®

Finding the ways that work

EDF methane leakage study modules

Steering Committee report approval dates

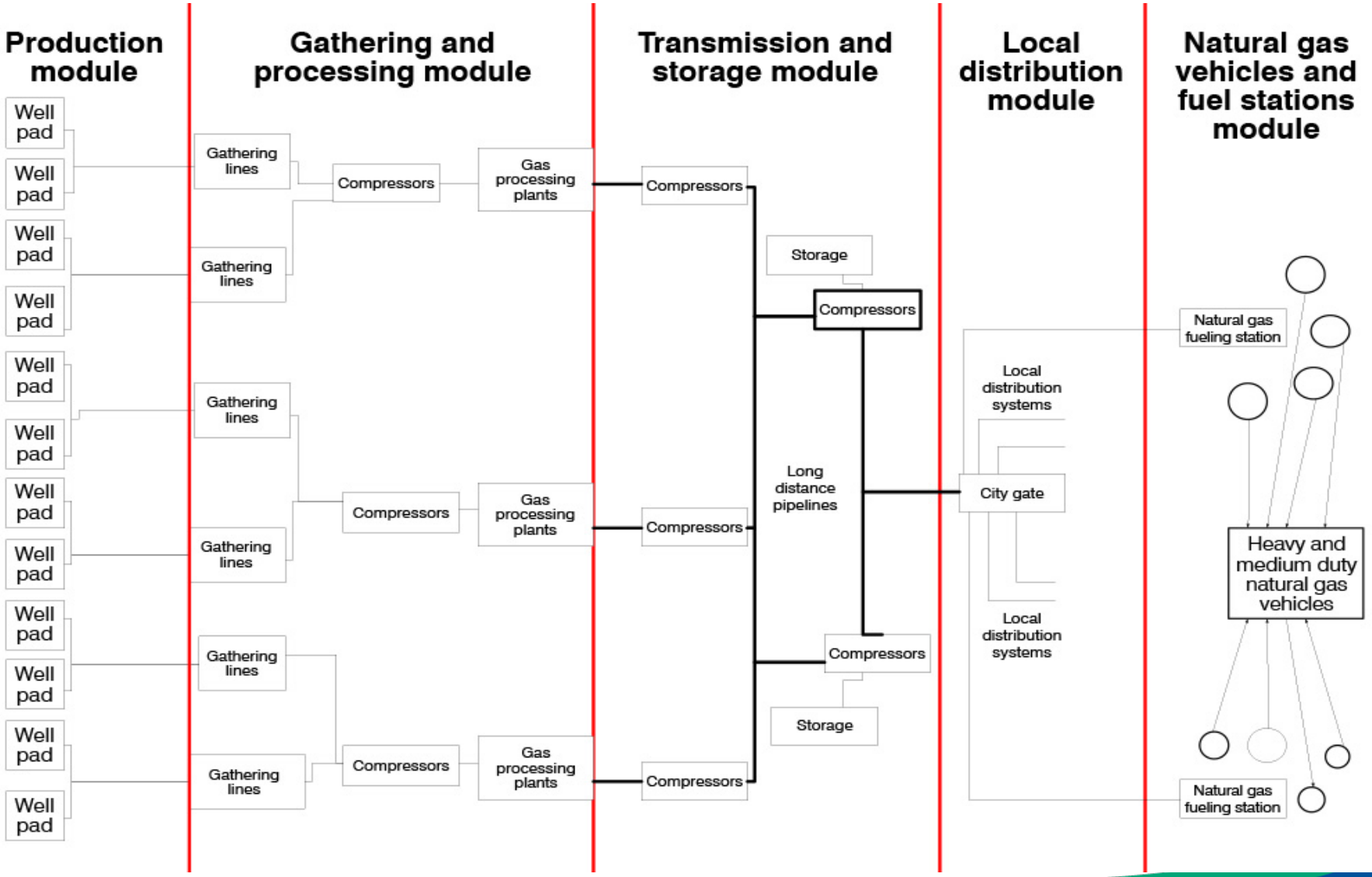
Phase 1 – Done
Phase 2 – Spring '14

Summer '14

Spring '14

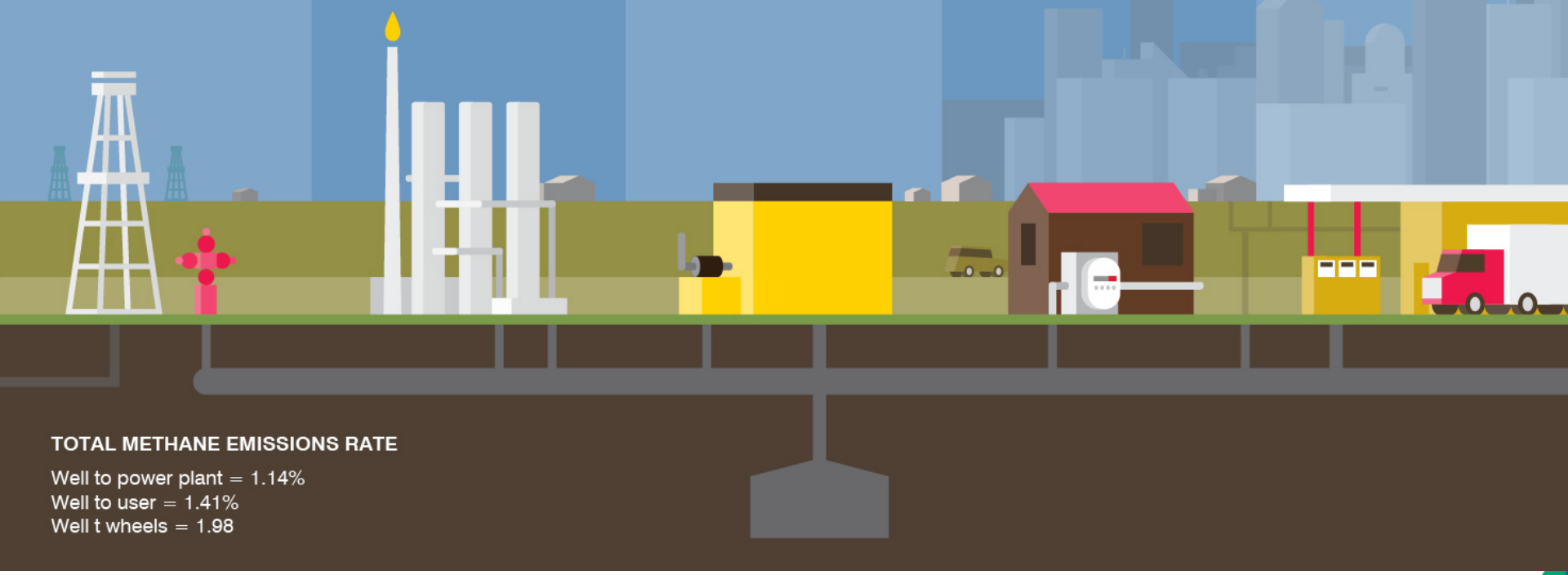
Winter '14

Spring '13



RECENT ESTIMATES OF U.S. NATURAL GAS EMISSIONS

Production	Gathering / Processing	Transmission / Storage	Local Distribution	Trucks & Stations
0.53%	0.19%	0.42%	0.27%	0.57%
(Allen, et. al PNAS 2013)	(EPA GHG Inventory 2013)	(EPA GHG Inventory 2013)	(EPA GHG Inventory 2013)	(EPA GHG Inventory 2013)

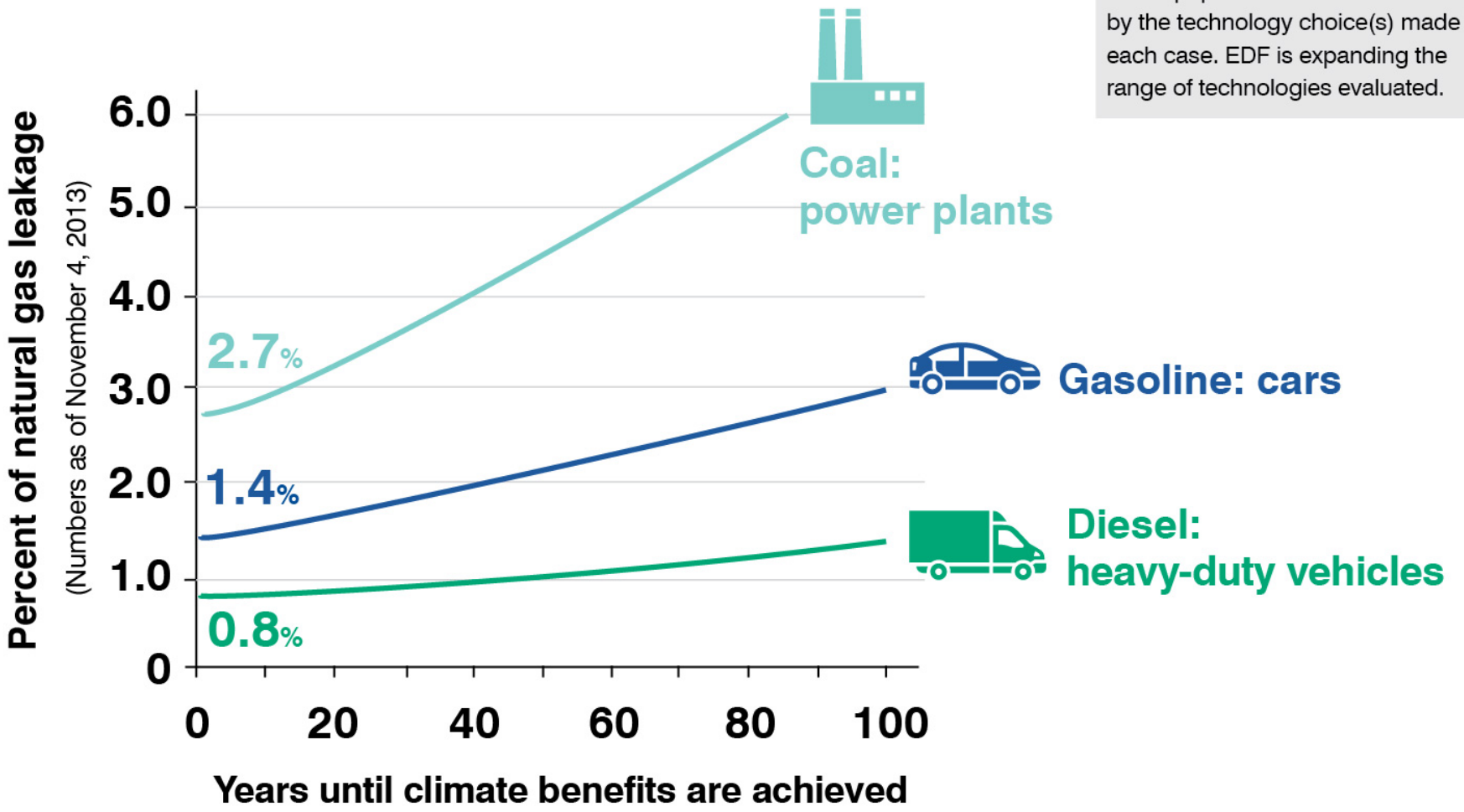


TOTAL METHANE EMISSIONS RATE

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.



EDF ENVIRONMENTAL DEFENSE FUND®
Finding the ways that work

*Adapted from Alvarez et al. (2012) PNAS, 109: 6435–6440, reflecting new IPCC AR5 & 2013 EPA GHG data. IPCC updates: (1) direct/indirect radiative forcing of CH_4 and CO_2, (2) CH_4 lifetime, (3) CO_2 impulse response function. Additional effects due to climate-carbon feedbacks and CO_2 from the oxidation of CH_4 not included. AR5 lacks data for further time-dependent analysis but EDF believes these effects to be small. Emissions updates included factors in Table 1 and corresponding L_{REF} values in Table S1 of PNAS paper; an L_{REF} value specific to heavy-duty CNG vehicles is now used.

Key Risk Management Areas

- Air Quality
- Disclosure
- Well Integrity
- Water and Waste Management
- Communities and Habitats

Thank You!

Andrew Williams
awilliams@edf.org

EDF
ENVIRONMENTAL
DEFENSE ACTION FUND PAC™