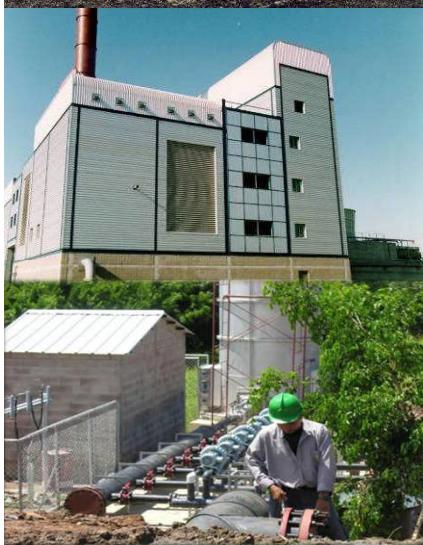


Biothermica



VAMOX® Projects at Walter Energy's Coal Mines

GMI Methane Expo
Vancouver | March 14, 2013



Agenda

- 1. Biothermica**
- 2. VAMOX® carbon project at
Walter Energy Mine No.4, Alabama, USA**
- 3. Moving forward – upcoming projects**

Biothermica



Biothermica

What we do

- Canadian group founded in 1987
- Develop **patented technologies** applied to industrial emissions control and methane destruction/utilization
- Finance, build, own and operate **carbon credit** and **energy** production facilities
- Based on destruction/utilization of **methane** from **landfills** and **coal mine** ventilation systems





Industrial Emissions Control



BIOTOX® Technology

Regenerative Thermal Oxidation (RTO)

Non-conventional industrial emissions

> 10 industrial processes since 1990

9 patents

Award winner from the U.S. AWMA



BIOTOX® unit

Presque Isle, Maine, USA

Food industry

100,000 cubic feet per minute (cfm)

COC¹ emissions

Biothermica

¹ Condensable Organic Compounds



Landfill Methane Selected Projects



Gazmont 25 MW Power Plant
Montreal landfill (Canada)
Finance, Build, Own, Operate
2 billion kWh of electricity since 1996



El Salvador CDM Project
Nejapa landfill
Finance, Build, Own, Operate
100% equity
215,000 carbon credits over 2006-2008
Major interest in project sold in 2008
MIGA insurance



Multilateral Investment
Guarantee Agency
World Bank Group



VAM Project Development Natural Evolution



Industrial Emissions
Expertise



Landfill Methane
Project Development



VAM Project Development



VAMOX® unit at Walter Energy No. 4 Mine
Alabama, USA
Finance, Technology, Build, Own, Operate

Biothermica



Agenda

- 1. Biothermica**

- 2. VAMOX® carbon project at Walter Energy Mine No.4, Alabama, USA**

- 3. Moving forward – upcoming projects**



**WALTER
ENERGY™**

- **Leading producer and exporter of metallurgical coal**
- **Headquartered in Birmingham, Alabama (USA)**
- **Operations in the U.S., Canada and the UK**
- **2012 revenues of \$US 2.4 billion**
- **Over 4,000 employees**

Biothermica

Walter Energy Global Operations





VAMOX® Project Overview

- **JWR Bleeder shaft 4-9, No. 4 Mine, Brookwood, AL**
- **First of its kind (MSHA) at active U.S. coal mine**
- **Financed by Biothermica, 100% equity**
- **Objective 1: Demonstrate VAMOX® RTO technology**
- **Objective 2: Assess key factors for financial viability**
- **Full operation over March 2009 – February 2013**
- **Registered with the Climate Action Reserve**





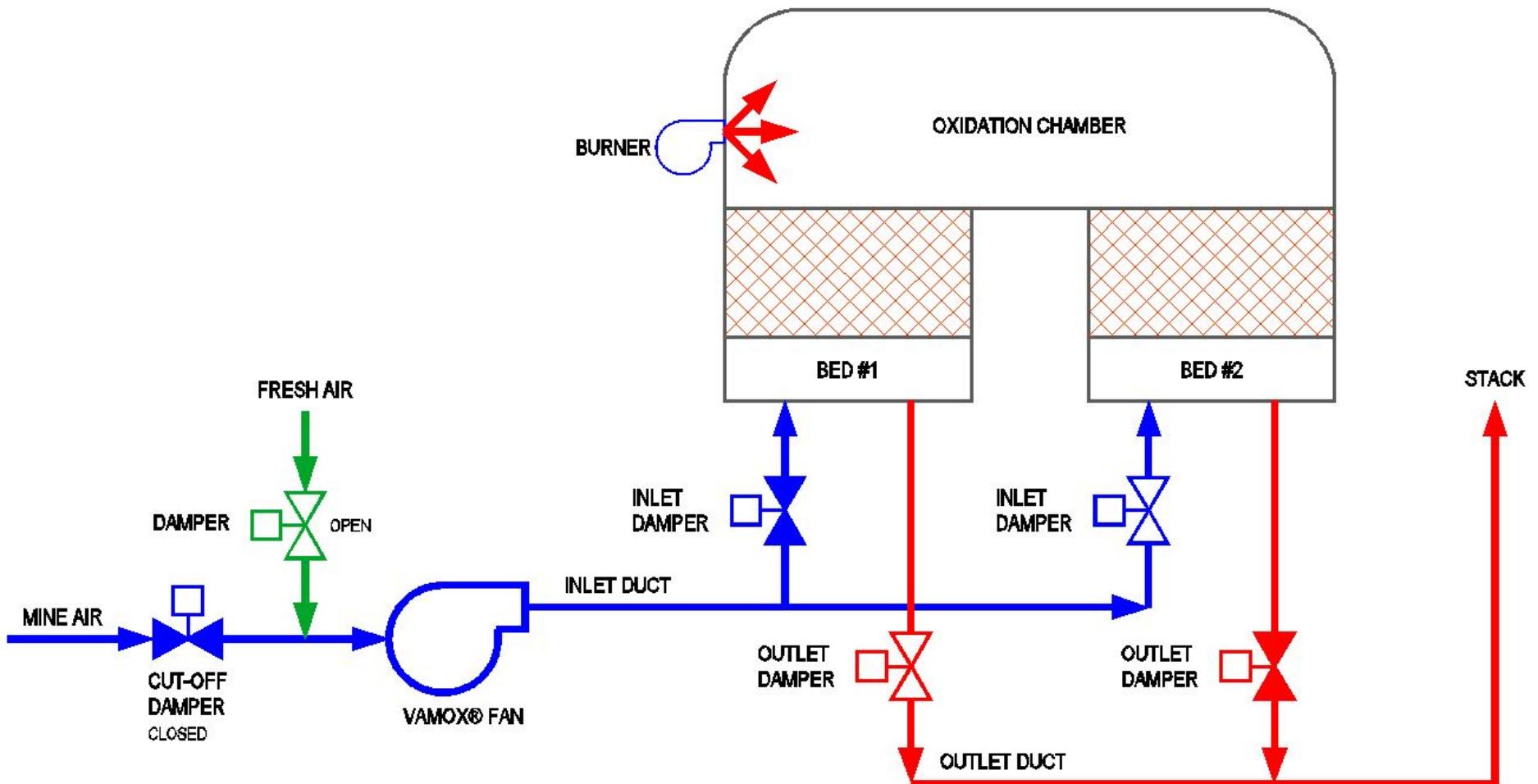
VAMOX® Project Specifications

- **2 ceramic bed RTO**
- **Medium size unit - 1,400 ft² footprint (40*35)**
- **30,000 cfm nominal flow rate, 10% of VAM flow**
- **0.3% - 1.2% range of CH₄ level accepted**
 - Dilution with fresh air if incoming VAM > 1.2%
- **VAM destruction only**
 - Revenues from carbon credit generation

Biothermica



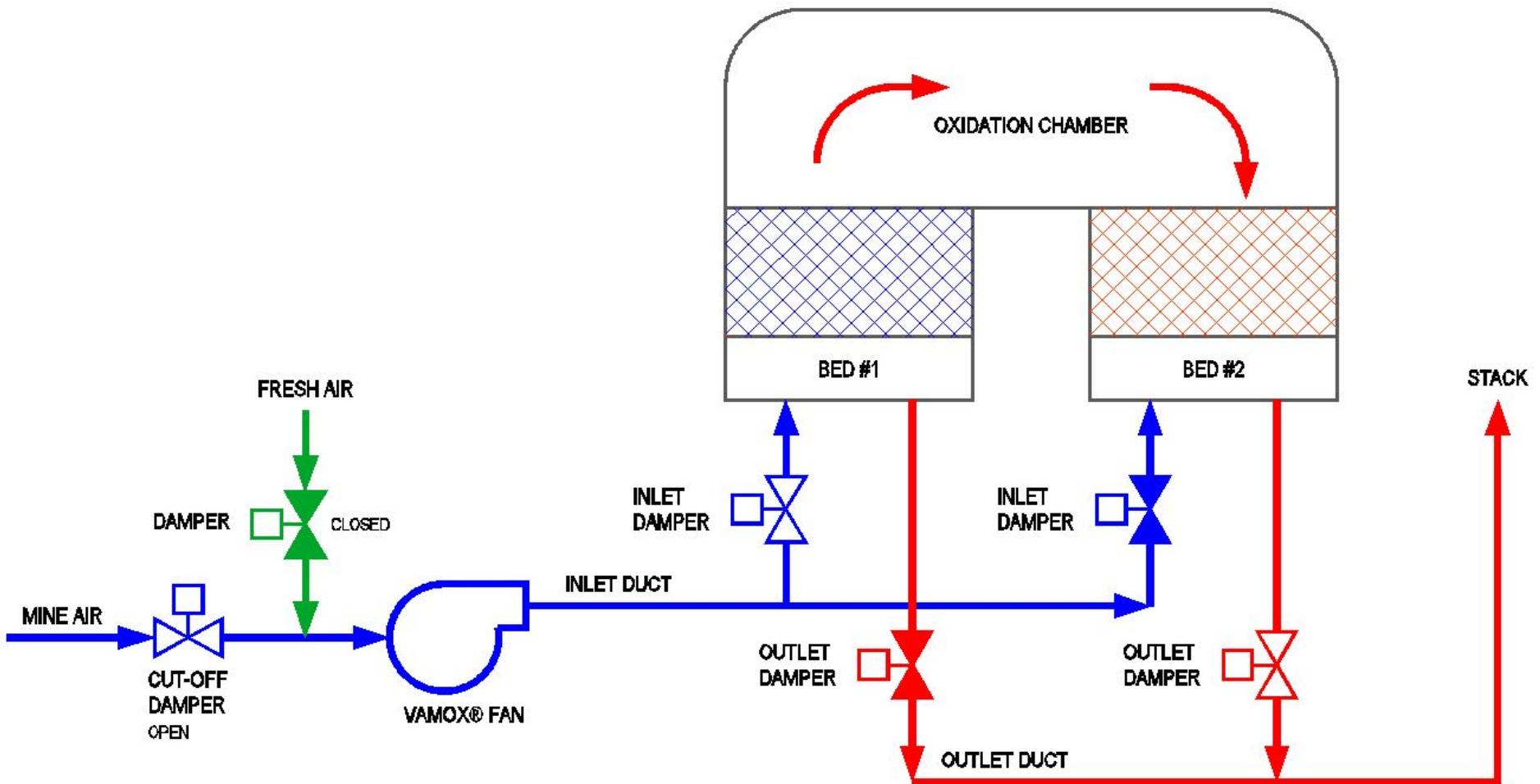
Operating Principle Start-up





Operating Principle

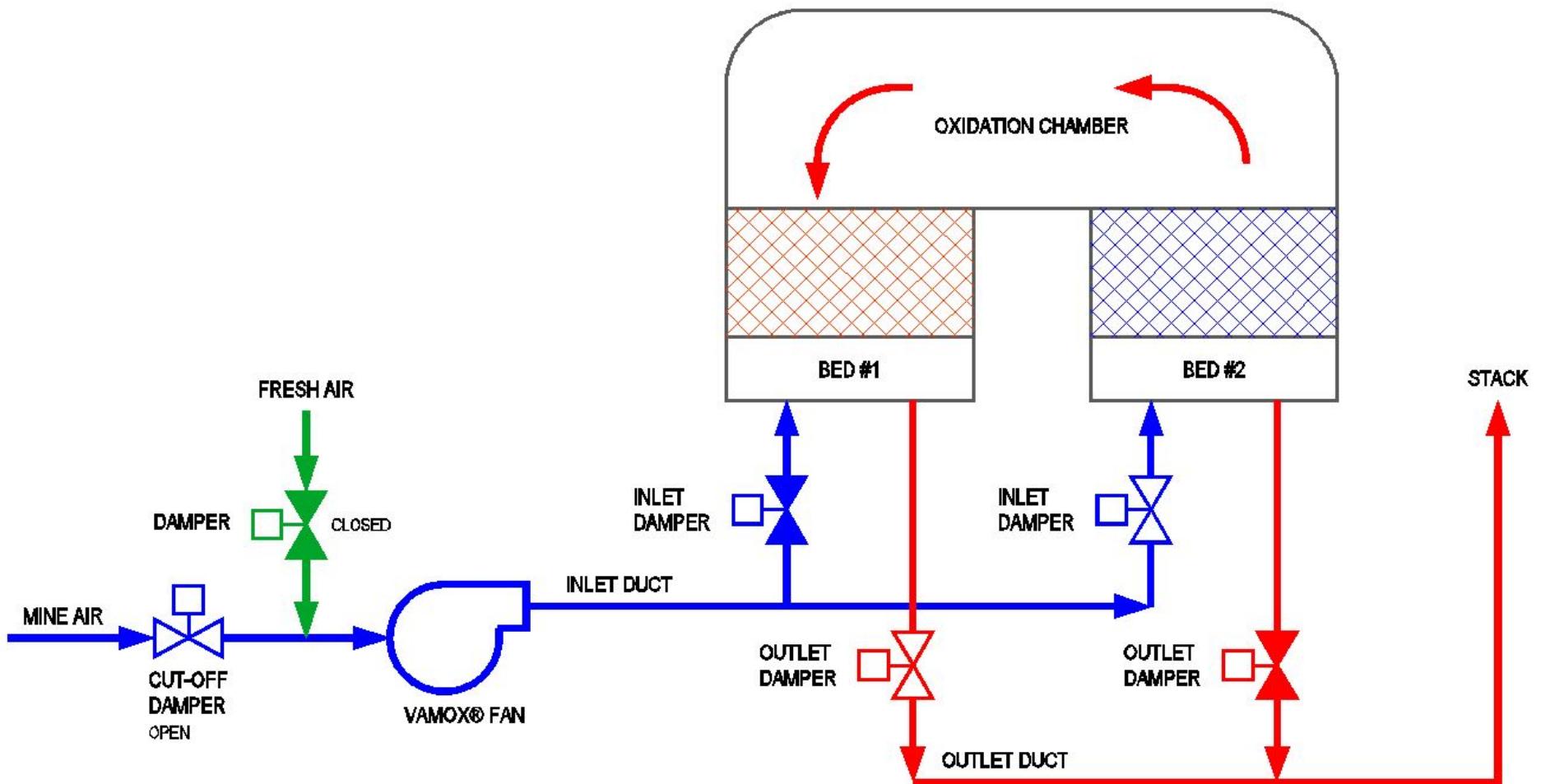
Cycle 1





Operating Principle

Cycle 2









VAMOX®

Carbon Project Cycle

Monetization

Project
Listing



CLIMATE
ACTION
RESERVE



CLIMATE
ACTION
RESERVE

Issuance of
CRTs



Monitoring

CAR CMM
Protocol



Verification



RUBY CANYON ENGINEERING

Biothermica



Project results Since March 2009

> 27,500 hrs
Operation hrs

93%
availability¹

> 80,000
tCO₂e emission
reductions

70,387
CRTs issued

¹ Excluding external events such as Electricity supply outages or [CH₄] < 0.3%



Monthly Availability

Reporting period # 4



¹ Excluding external events – most essentially $[\text{CH}_4] < 0.3\%$



Methane Level At Shaft Since March 2009

Min: 0.2 %

Max: 1.5 %

Operational experience over wide range of
fluctuating concentrations



Financial Viability

Key Factors

COSTS

- CAPEX
- Electricity
- Operation & Maintenance

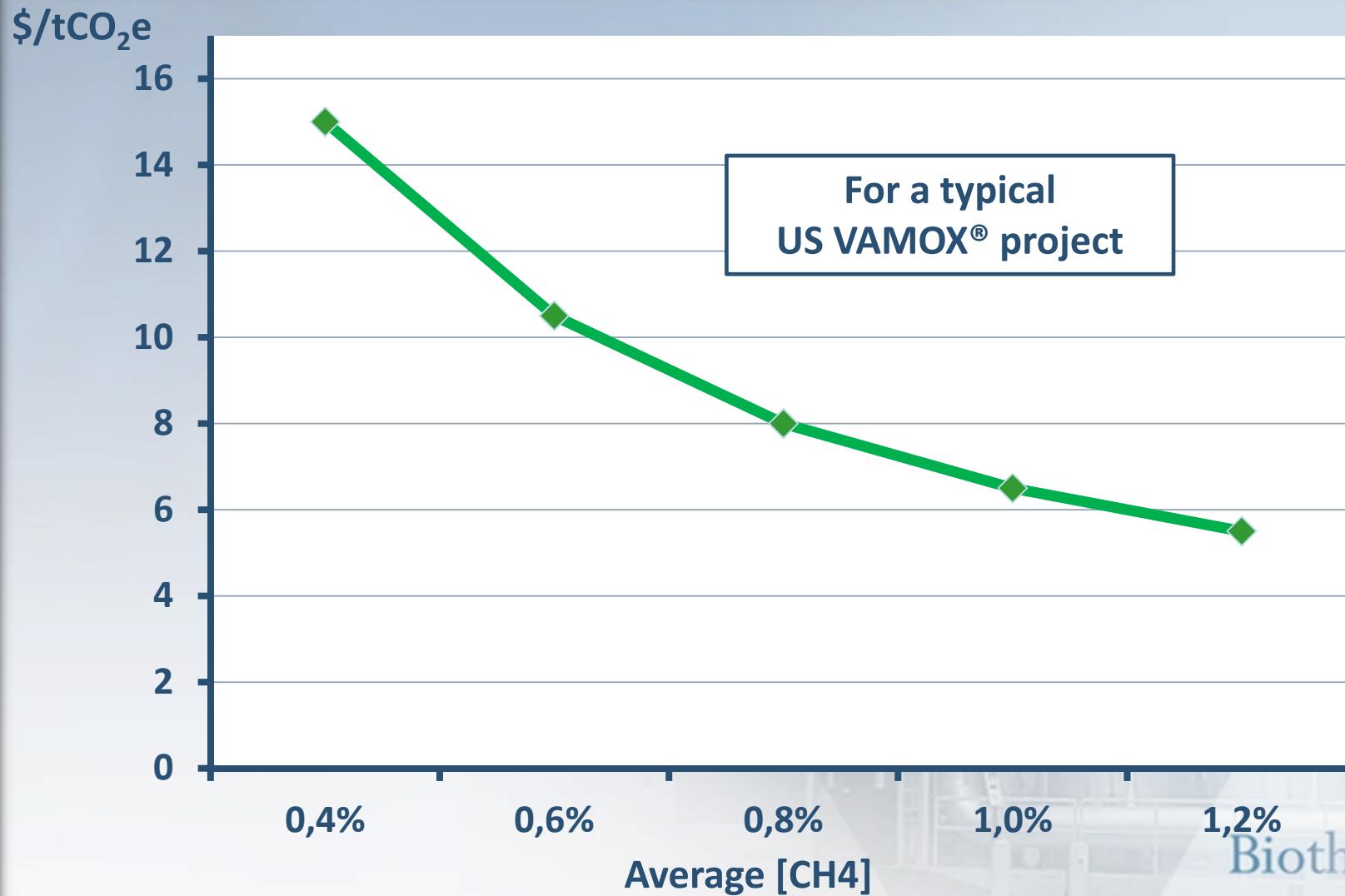
REVENUES

- VAM concentration
- Carbon credit price
- VAM flow rate
- System availability
- Destruction efficiency

Biothermica



Carbon price triggers



Biothermica



Agenda

- 1. Biothermica**

- 2. VAMOX® project at Walter Energy
Mine No.4, Alabama, USA**

- 3. Moving forward – upcoming projects**



Moving Forward

- Partnership with  **WALTER ENERGY™**
- Long term commitment to VAM
- Mitigate VAM from all economically suitable shafts

Biothermica



VAMOX® standard unit

- **130,000 cfm nominal flow rate**
- **5,000 ft² footprint (100*50)**
- **Design optimized based on proprietary model**
- **Designed for facilitated relocation**
- **0.3% - 1.2% range of CH₄ level accepted**
- **Fully automated operation**
 - Auto-adjustment of operating conditions

Biothermica



Upcoming Project

- Bleeder shaft of Mine No. 7
- Shaft: 300,000 cfm, $\geq 1\% \text{CH}_4$
- VAMOX® systems
 - 2 large scale standard units
 - Air flow processed: 260,000 cfm
 - $\pm 400,000 \text{tCO}_2\text{e/yr}$

Biothermica



Walter Energy Mine No. 7

Bleeder Shaft





Project Status Summary

- **Design completed**
- **Approved by MSHA District 11 (May 2012)**
 - As addendum to mine ventilation plan
- **Green light when framework certainty (California)**



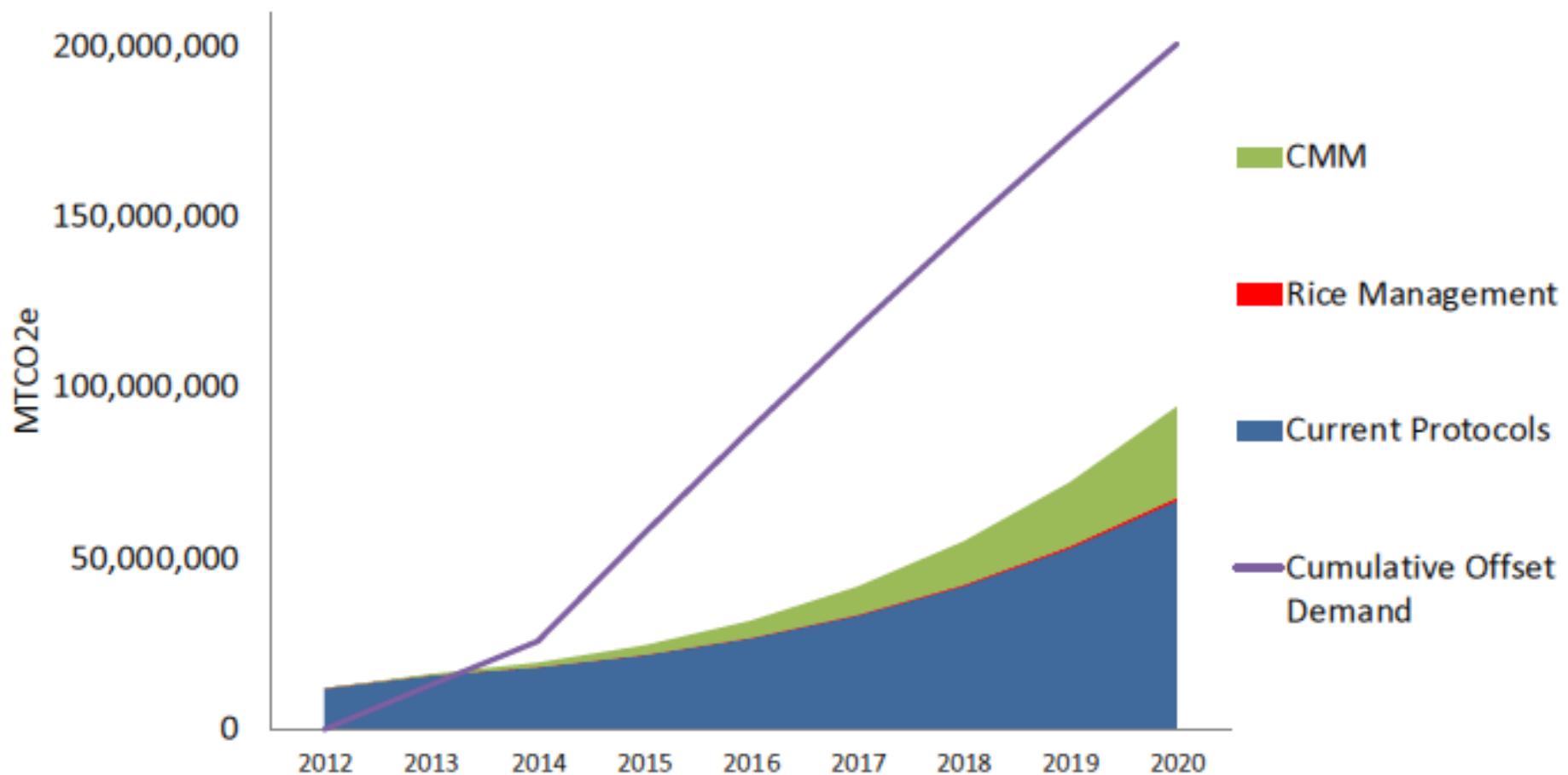
California Regulatory Status

- December 2010: Cap & Trade Regulation adopted
- 4 Offset Protocols currently adopted + Early Action
 - ODS¹, Forestry, Urban Forests and Livestock
- CMM Offset Workshop on March 28, 2013
- Adoption of CMM Protocol expected by end of 2013

¹ Ozone Depleting Substances

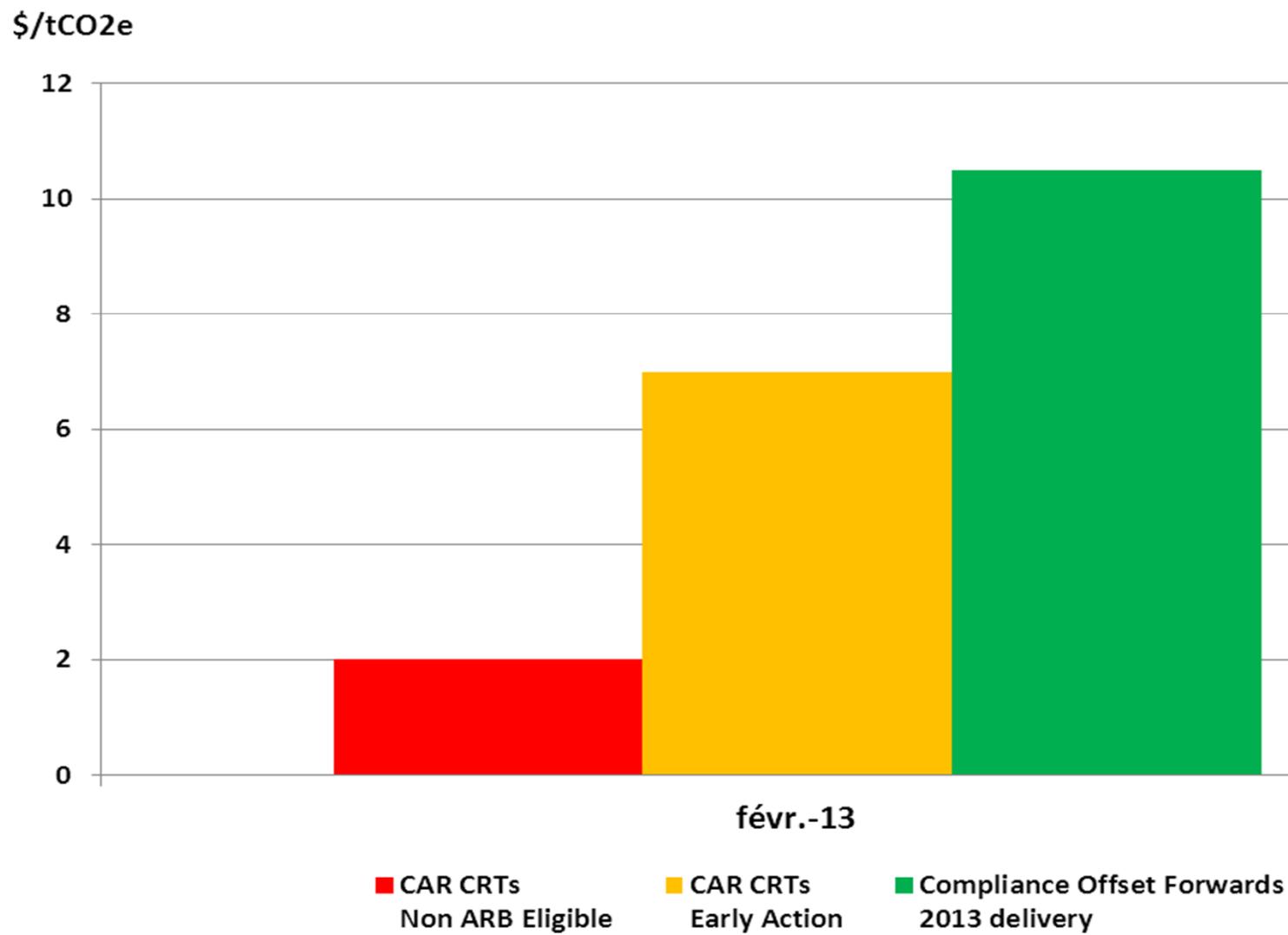


FORECAST OFFSET SUPPLY: Compliance + Rice + Coal Mine Methane (CMM)





Carbon Offset Prices California Market





Thank You

Raphaël Bruneau, M.Sc.

Director – Carbon Markets

+1.514.488.3881 x226

raphael.bruneau@biothermica.com