AMYRIS
RENEWABLE CHEMICALS & FUELS

Launching a Business with New Products, New Process, New Plant, New Geography

2014 BIO World Congress

Chuck Kraft

Cautionary Note re: Forward Looking Statements

This presentation and oral statements accompanying this presentation contain forward-looking statements, and any statements other than statements of historical facts could be deemed to be forward-looking statements. These forward-looking statements include, among other things, sizes of markets that may be addressed by Amyris's current and potential products, Amyris's expected product pipeline, sales volumes and average selling prices, production volumes and costs and associated product launch timing expectations, operation of production facilities, commercial relationships, and financial results, that involve risks and uncertainties. These statements and other forward-looking statements that may be provided in the presentation and/or oral statements accompanying it are based on management's estimates and current expectations and actual results and future events may differ materially due to changes in Amyris's business and various risks and uncertainties, including those associated with any delays or failures in development, production and commercialization of products, liquidity and ability to fund capital expenditures, Amyris's reliance on third parties to achieve its goals, and other risks detailed in the "Risk Factors" section of Amyris's quarterly report on Form 10-K filed on April 2, 2014. Amyris disclaims any obligation to update information contained in these forward-looking statements whether as a result of new information, future events, or otherwise.

One Word

CHALLENGING!

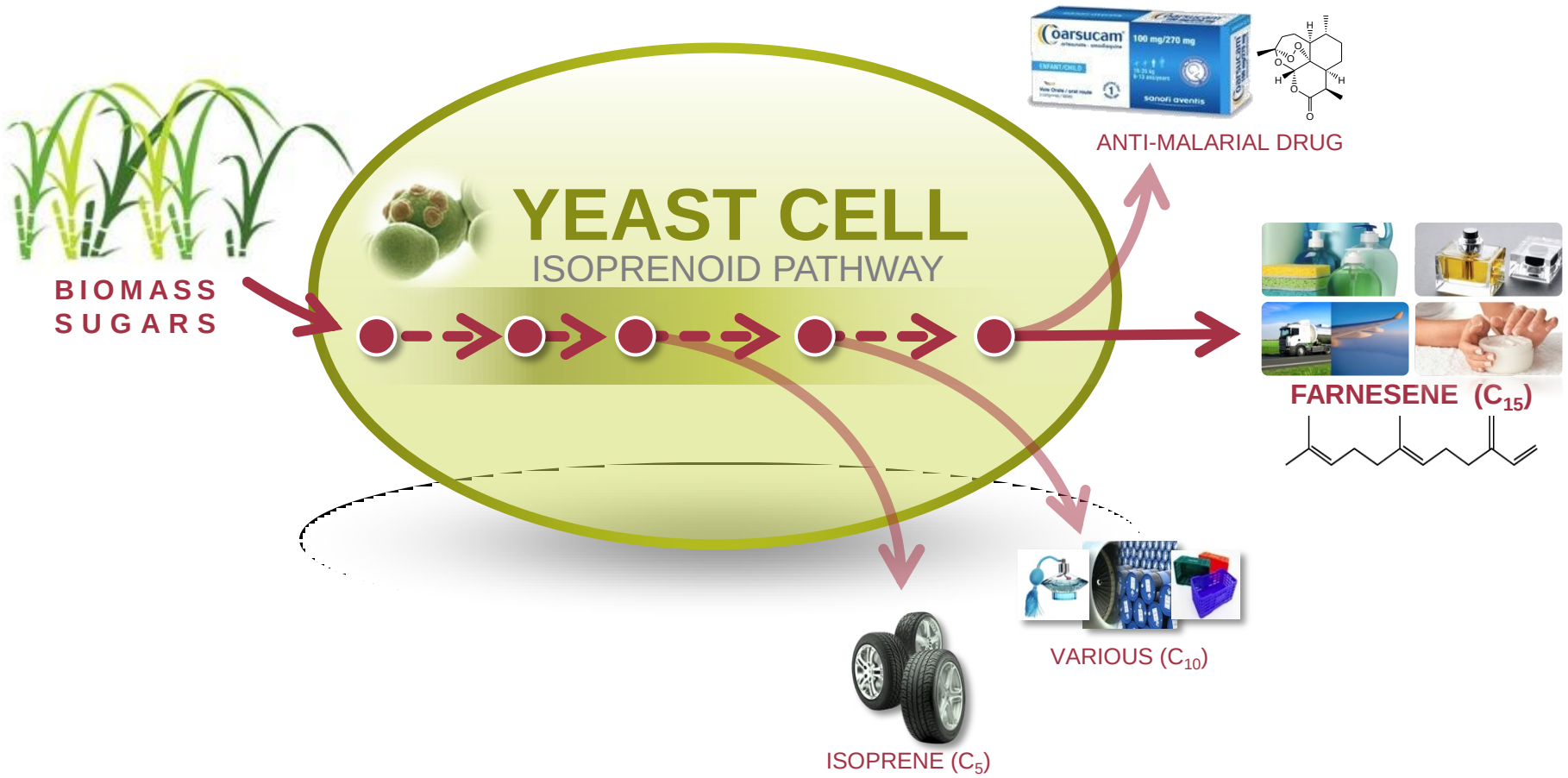
Amyris: The Industrial Synthetic Biology Company

- ✓ Best-in-Class Technology
- ✓ Scaled Manufacturing
- ✓ No Compromise® Products

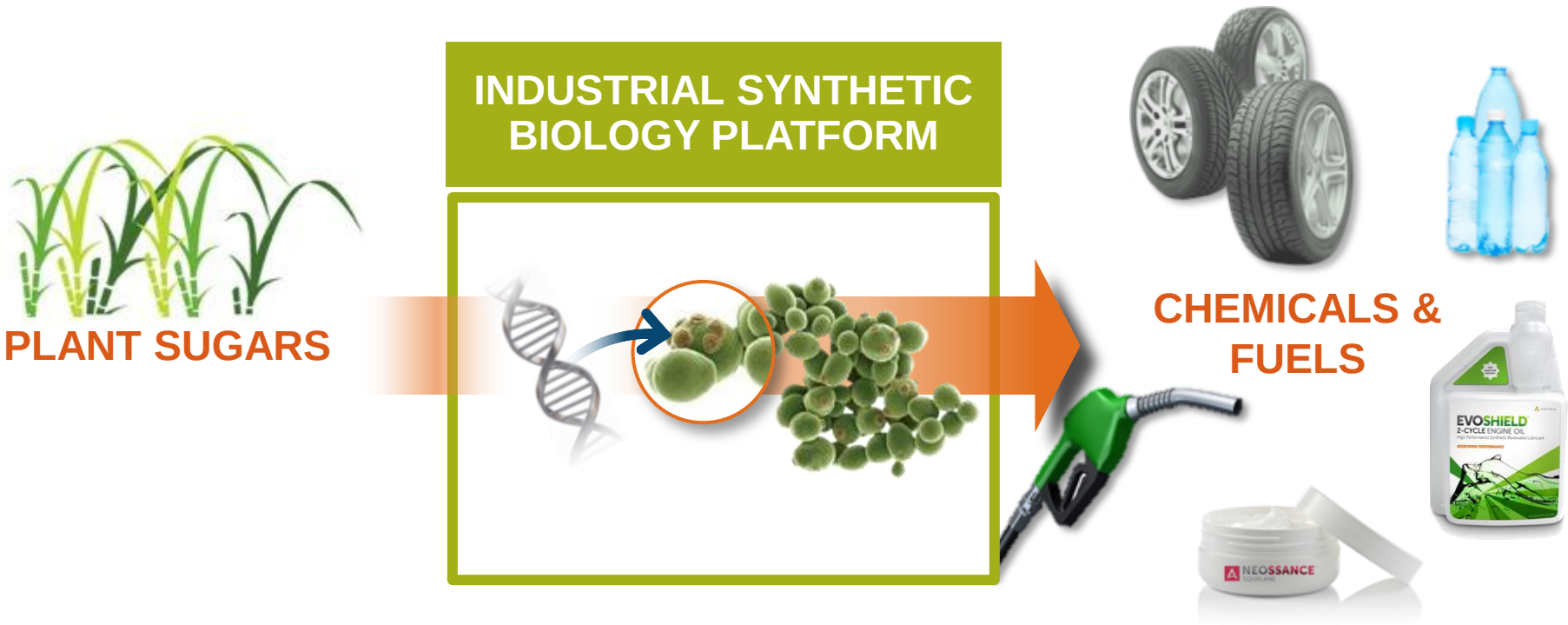
- Founded in 2003 by post-doctoral fellows from the University of California, Berkeley.
- Headquartered in the San Francisco Bay Area and with operations in Brazil.
- 390 full-time employees, of which one-third are PhDs.
- Backed by leading investors and strong partnerships with global brands.

AMYRIS

Synthetic Biology: Technology of the Century



Disruptive Platform for Renewable Products

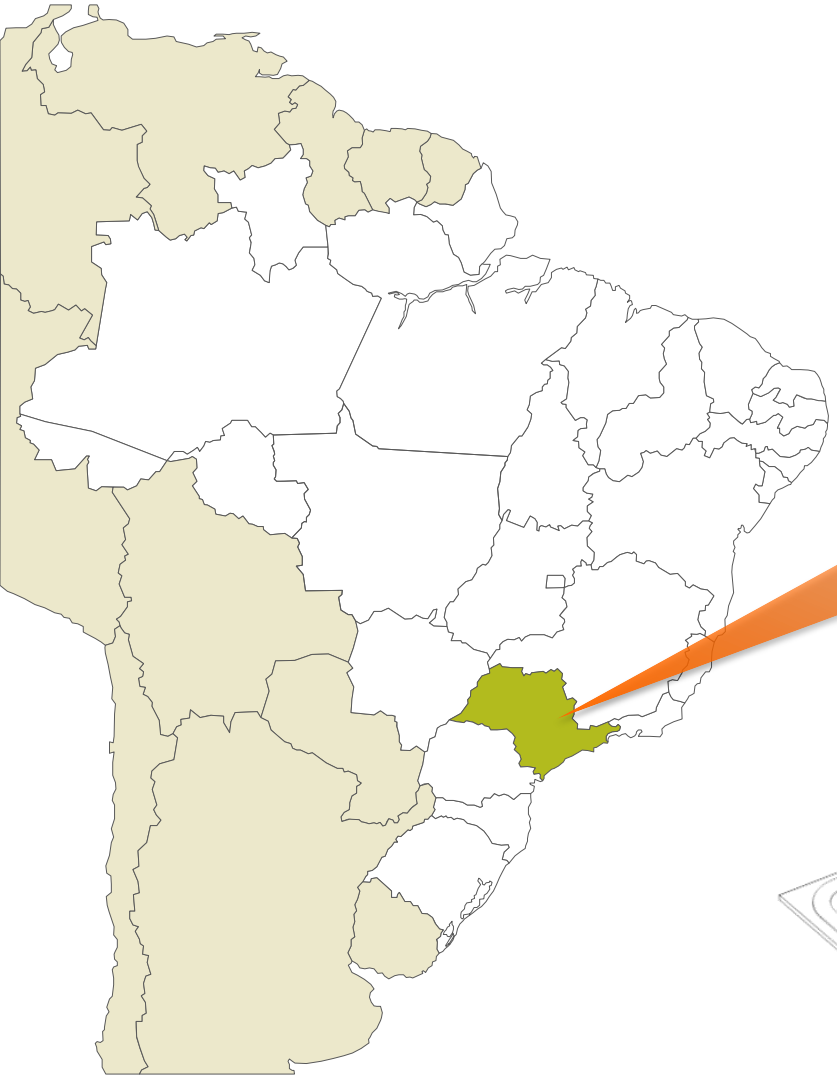


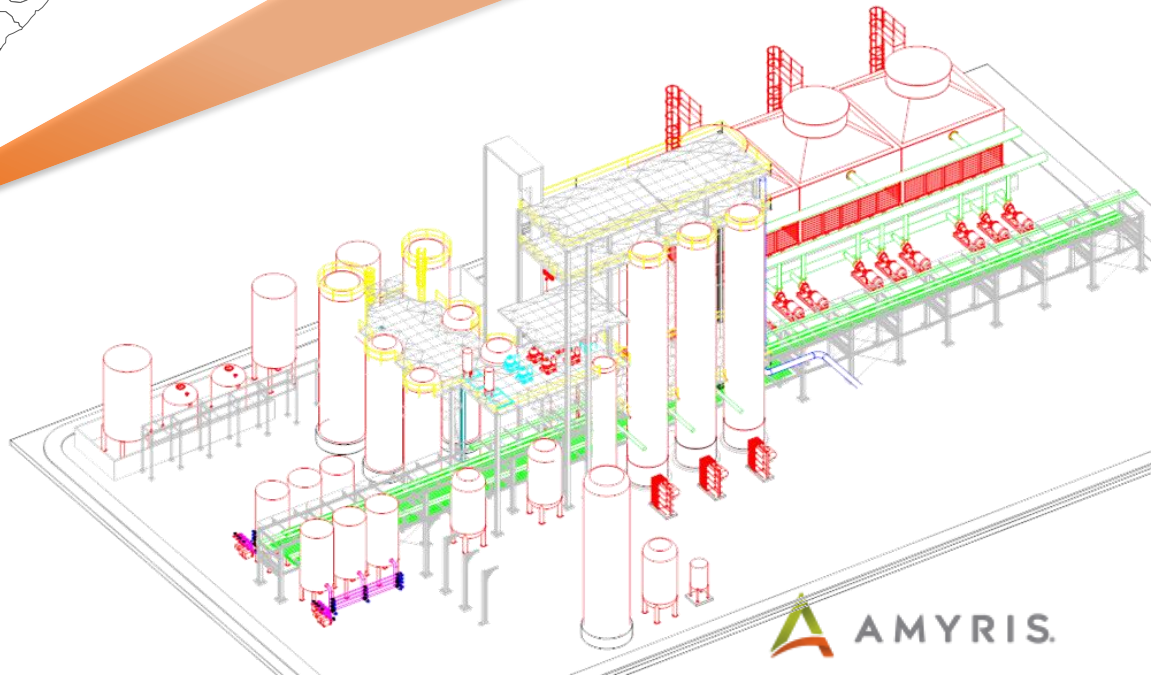
LEADING INVESTORS

TOTAL · TEMASEK HOLDINGS · KPCB · BIOLDING investment · TPG BIOTECH · khosla ventures · naxos · Fidelity INVESTMENTS

AMYRIS

Amyris Focused in Brazil



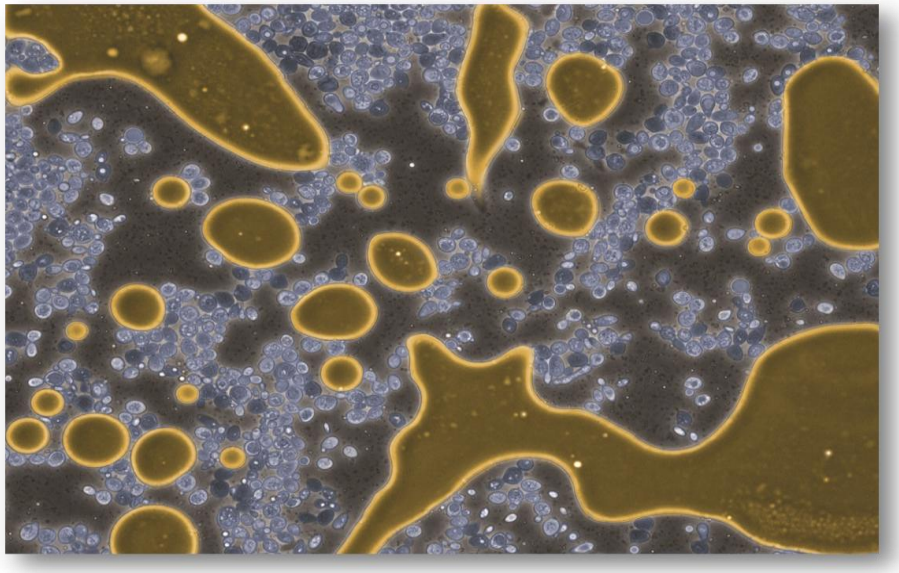


AMYRIS

Challenges

Success requires:

- Strain development
- Low cost substrate
- Successful scale-up and operations
- Market demand



Phase-Contrast Micrograph of Amyris' Yeast Producing Farnesene

Each of these are impacted by choices made early on by the business and therefore must be carefully studied.

Once made these choices are difficult and costly to change.

Strain Development

Key Learnings:

- Genetically Modified Designation
  - Impacts plant design, procedures, recordkeeping, waste disposal
  - Factor in time for approvals
  - Expect audits
  - New or different strains require new approvals
- Localize the strain before implementing at commercial scale
  - Testing it on the local substrate is a must
  - Testing it on local ingredients is also recommended
  - Best way: Pilot scale operations in the country where you operate

Low Cost Substrate

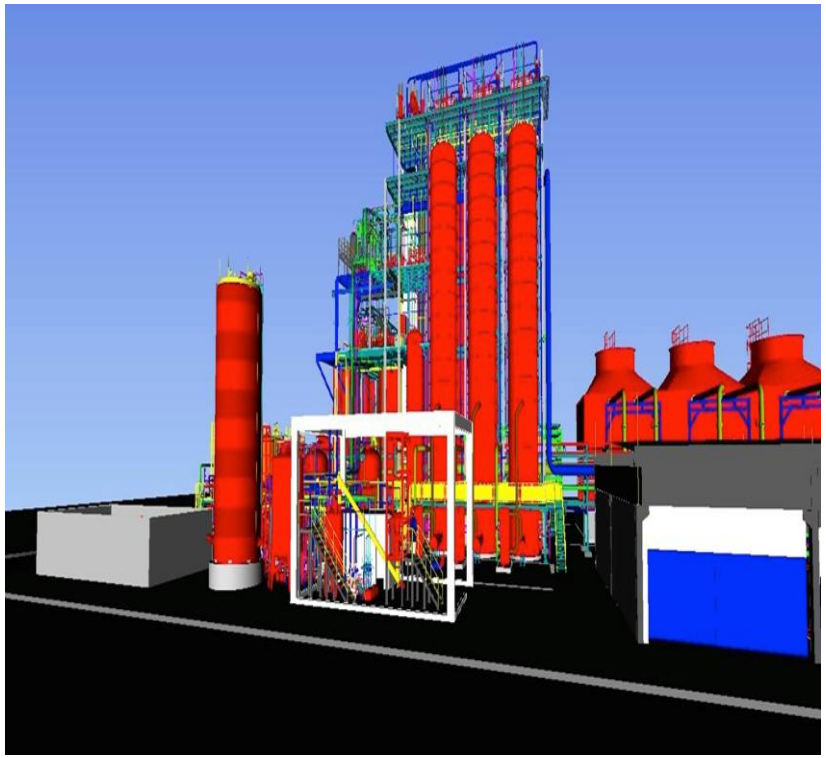
Key Learnings:

- Substrate determines your country of manufacture.
- Guarantee your security of supply.
  - Substrate availability
  - Year round availability or only seasonal
  - Logistics of supply
- Substrate quality
  - How much variability should you expect
  - What specifications and analytical testing do you require
  - How much variability can you tolerate
- Must do your strain and process development with the substrate you intend to use
  - Best way: Pilot scale operations in the country where you operate

Scale-up and Operations

Key Learnings:

- In the first plant it's difficult to predict what you don't know
  - Must involve the manufacturing/process engineers in the design
  - Layout should incorporate flexibility in case the downstream process changes
  - Utility back-up systems are a must
- Plant Staffing
  - Hire the Production Team as early as possible so they can be involved in equipment check-out and commissioning
  - Local Plant Manager and Maintenance Manager will provide local knowledge and connections
  - Remote locations might provide challenges for hiring and retention



Scale-up and Operations

Key Learnings:

- Start-up
  - Critical to have support from Process Development and Engineering.
  - Spending time upfront to test the sterility of your process will save time in the long run.
- Other
  - Access to technical support, spare parts, instrumentation will likely be more difficult.
  - Don’t forget to commission the QC lab.
  - Safety becomes more and more critical as you start to introduce utilities and chemicals to the plant.

Market Demand

Key Learnings:

- Product adoption cycle controls demand
  - Uncertainty of demand requires a flexible production schedule
    - Leads to shutdowns and start-ups
    - Provides an opportunity to implement improvements that are learned during the early days of plant operation
    - Provides an opportunity for the Production Team to learn how to start-up and shutdown the process efficiently
- Logistics for product delivery need to be addressed early on


Fuels


Lubricants


Home & Personal Care


Polymers & Plastic Additives


Flavors & Fragrances

Cosmetics

AMYRIS

Brotas Manufacturing Facility.

Our Brotas plant began operating in December 2012. It achieved steady-state farnesene production in its six 200,000 liter fermentors in July, 2013.

Thank You

AMYRIS®

RENEWABLE CHEMICALS & FUELS