

Posing a question

Sapphire Energy began with a debate between three friends:

Why is the biofuel industry spending so much time and energy to manufacture ethanol — a fundamentally inferior fuel?

The debaters were scientists and business people: entrepreneur and bioengineer Jason Pyle, Kristina Burow, chemist turned venture capitalist, and Nathaniel David, a biologist and serial company builder. To them, the downsides of ethanol and most biofuel approaches were obvious.

As scientists, they understood that the process of cultivating complex, slow-growing plants such as corn—only to deconstruct them to produce ethanol—is inherently inefficient and emits more carbon dioxide than it consumes. As business people, they knew that the only way to make ethanol financially viable requires government subsidies. As concerned citizens, they thought about the environmental and human costs of depleting agricultural lands and rainforests. And, finally, as Americans, they recognized the country’s dependence on foreign oil posed a very real risk to national security.

They were convinced that *real* solutions required radical new thinking and a commitment to the development of new technologies. The original question quickly evolved:

How could they produce a renewable fuel without the downsides of ethanol and biodiesel? What process required the fewest steps, was the most environmentally responsible, and resulted in the highest value fuel?

Recruiting the best

First off, they needed a scientist with the vision to take on the mission of creating a whole new way to produce fuel. Mike Mendez was first on their list. Mike is the person most responsible for the creation of the Xenomouse, a genetically modified animal capable of producing entirely human antibodies, and GVAX, a cancer vaccine now in clinical trials. David, who’s known Mike for nearly 20 years, describes him as “an experimental force of nature like no other — who delivers what others say is impossible; and he does so again and again.”

To that, Mendez responds, “As a scientist there’s nothing better than a huge problem with big payoffs. This is a mind–blowing opportunity to do something unprecedented and change the world.”

Once Mike was on board, the founders looked for someone with broad expertise in plant biology — which led to the labs of Steve Mayfield and Steve Briggs. Burow worked with both in the past and knew the combination of ‘the two Steves’ would be powerful. Mayfield is widely regarded as the world’s leader in the creation of transgenic algae. Briggs, who oversaw the

sequencing of the rice genome, is a pioneer in the development of genetically modified crops. Both were highly sought after scientists. After only one meeting, they agreed to collaborate when they learned of Sapphire's goal to create a renewable, environmentally friendly fuel that was in every way compatible with the current 'gasoline' economy.

Extreme Venture Capital

The same radical thinking that was energizing the growing group of scientists also happened to be the trademark of Sapphire's institutional co-founder, ARCH Venture Partners. ARCH, one of the leading early-stage technology venture groups, thrives on technical innovations that fundamentally *fracture* existing markets.

For many months, Burow and ARCH co-founder Robert Nelsen had been having a parallel conversation about why all the biofuel deals being funded by other venture capitalists were grossly missing the point. They brought in Clint Bybee, ARCH co-founder with a background in petro chemistry, to help round out their expertise. The group toyed with the need to start their own company — and the nascent scientific conversations of the Sapphire team were the perfect catalyst.

Thus, with the support of ARCH, they addressed the most fundamental question of all:

If you had a blank slate and could create the perfect biofuel company, what would it look like?

Nothing was left off the table. The entire group met many times at ARCH's San Francisco office in an offbeat, converted warehouse. After many meetings and much lively discussion, the plan took shape and a company was born.

Introducing Sapphire Energy

After a year of examining the challenge from every angle, it was time to take action; Sapphire Energy was formally launched in May of 2007.

Sapphire's goal is to be the world's leading producer of renewable petrochemical products. With Pyle leading the group, the team has built a revolutionary molecular platform that converts sunlight and CO₂ into renewable, carbon-neutral alternatives to conventional fossil fuels without the numerous downsides of current biofuel efforts. First up: renewable gasoline.

The company's platform offers vast advantages — scientific, economic, environmental and social — over traditional biofuel approaches. The company's production process relies on photosynthetic microorganisms, such as algae, sunlight, CO₂ and non-arable land. The end product is *not* ethanol — and *not* biodiesel. The end product is, in fact, *gasoline*.

Critically important, there is no 'food vs. fuel' tradeoff. The process is not dependent on crops or valuable farmland. It is highly water efficient, delivering 10 to 100 times more energy per acre than cropland biofuels.

And, perhaps most importantly, Sapphire's fuel products are chemically identical to molecules in crude oil, making company products entirely compatible with the current energy infrastructure — cars, refineries, and pipelines. Sapphire's scalable production facilities can grow easily and economically because production is modular, transportable, and fueled by sunlight — and not constrained by land, crops, or other natural resources. Sapphire Energy is at the forefront of an entirely new industry category — Green Crude Production — with the potential to profoundly change America's energy and petrochemical landscape.