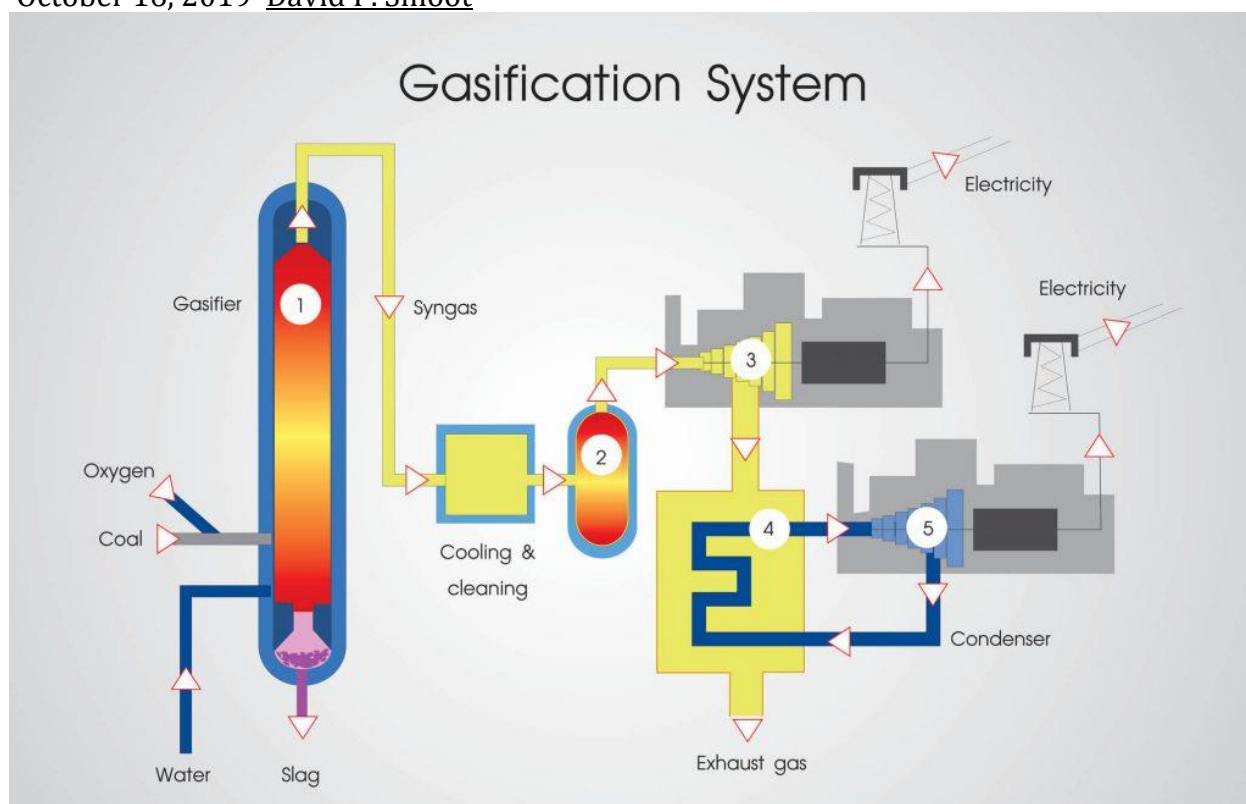




- SUSTAINABLE AVIATION FUEL**

The Evolution and Project History of Northwest Advanced Bio-Fuels

October 16, 2019 [David P. Smoot](#)



Interview with David P. Smoot of Northwest Advanced Bio-Fuels

Can you give me some background on why you're doing this project with Northwest Advanced Biofuels? What was the motivation from a human-interest point of view? Because I don't think you woke up one day and said, "I want to be in this renewable energy space." I would love to get a little bit of background on this.

David P. Smoot: We started in wind and solar in 2009. We knew all of the developers and landowners that possessed land they thought were going to be covered with homes and then the bottom fell out of the Subprime financial business and some big institutional investors like Lehman Brothers went bankrupt. We had knowledge of these sites we knew

were available and we received access to them. We decided to develop two very, very large projects in Coachella Valley, in California, both Solar, that was put on hold and eventually canceled after most of the development work had been done, due to the fact that there were no utility transmissions lines that would give us access to get the power outside of Coachella Valley to other cities and states.

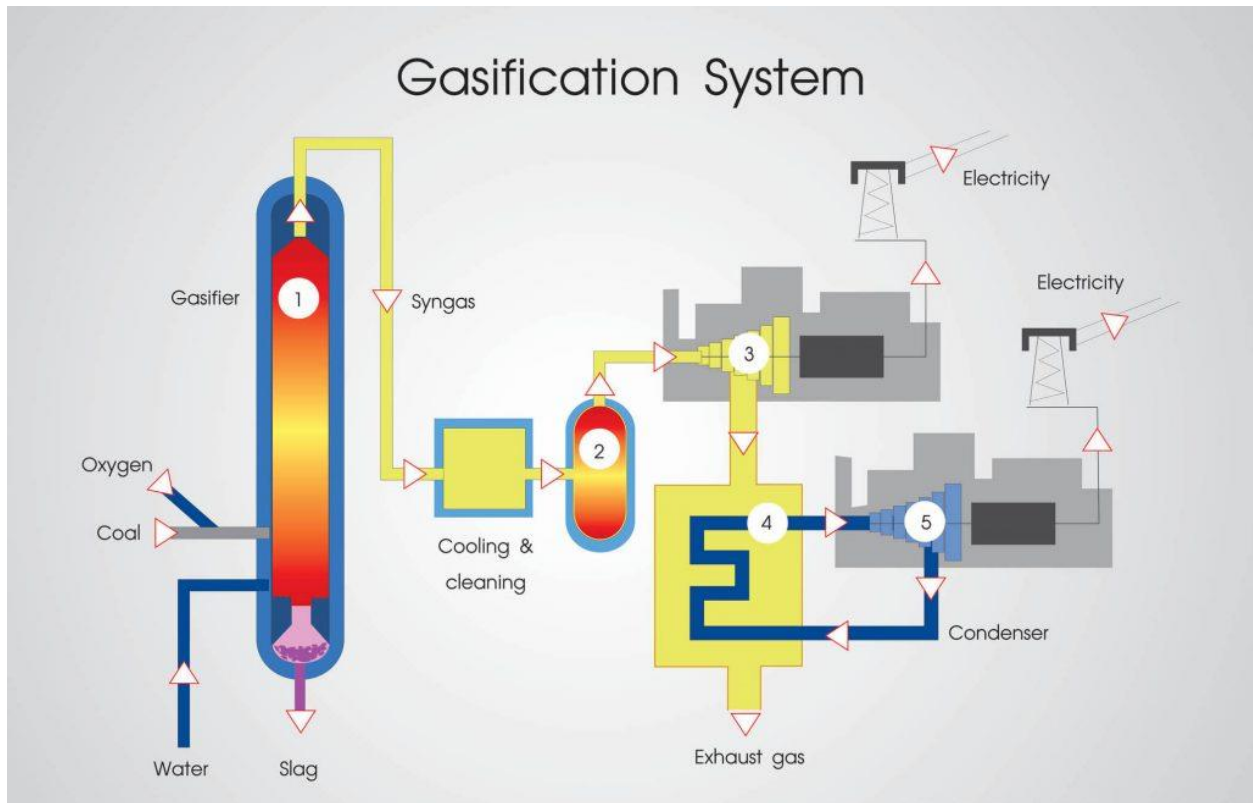


It was going to be at least five years, and they wanted hundreds of thousands of dollars at Sempra Energy, which owns San Diego Gas & Electric, San Diego Power, etc. They were going to hold our money, which we wouldn't get back, and then maybe we would get access to transmission lines that were to be built, but there was a good chance we would never get the access we needed.

We started to look at other forms of alternative energy because we believed in alternative energy. One of the things that caught our eye was a new industry taking off, which at the time was starting to be initiated in the State of California, mostly, where they were building gasification systems to burn wood and make electricity by driving turbines with steam that was created by the gasification of the wood.

Everything was built around electricity when we first got started out in alternative energy. We saw it as a good business opportunity. We saw it as an opportunity to improve in terms of the environment as well.

Our efforts were aimed at electricity in those days. Our first project in the gasification was in Maryland where we had a partner that had access to all the coal we could possibly need. We hired the largest law firm in the state of Maryland.



We hired the largest lobbying firm in the state of Maryland, which was owned by the former speaker of the House of the State of Maryland.

We even received a \$1 million grant from the governor at the time. They were very excited about us coming in to start the first coal to electric plant that was private, on private land, because of all of the big utilities that had been built to service the East Coast, which were just coming under huge scrutiny.

Eventually, that scrutiny got to us. It buried our project in Maryland because new coal-driven electricity plants in 2010 and 2011 was pretty much removed from, the list of potential new permits being allocated for the use of making electricity in Maryland. That battle still goes on today.

We turned to alternative forms of feedstock, from those which drove us out of Maryland. We had no contacts or interest in Maryland for municipal solid waste driven Projects.

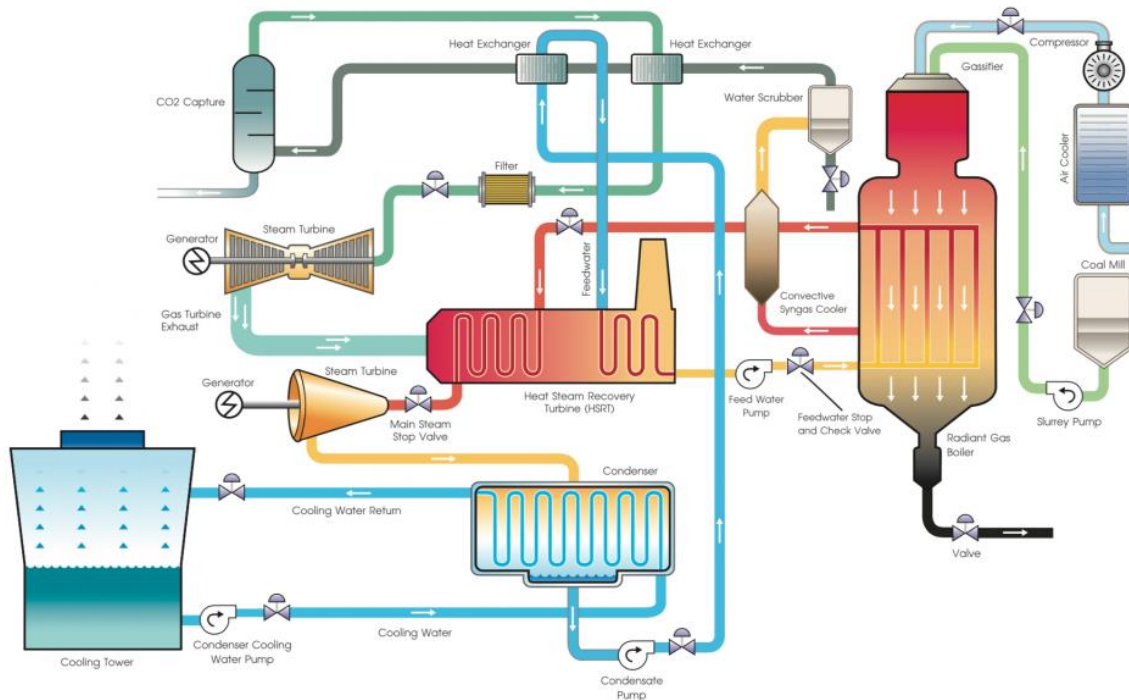
We came back to Arizona. We found a better technology that had more installations than the one we were looking at for electricity. It was a gasify process using municipal solid waste or coal to make electricity. It's being done today.

Not very many gasification systems have been set up to deal with metals, rocks, glass, etc. being placed inside the reactors, where they heat the feedstock. It requires a special kind of gasification unit.

We found a company in Maryland that had technology and experience in the field and knew how to deal with the issues of sorting municipal solid waste and green wood waste, at the

front-end of the process. We came back to Arizona, cut a deal with a Native American tribe to furnish the Project with green wood waste, a cleaner version of Feedstock that didn't have the metals, glass, etc., in it, and we thought, "This is perfect."

Integrated Gassification Combined Cycle Process Diagram



With landfills reaching capacity municipalities were going to have to stop taking in municipal solid waste from the cities of Scottsdale and Mesa, which they do now.

By us taking hundreds of thousands or millions of tons of their municipal green wood waste out of their landfill, it would enable them to take in millions of tons of municipal solid waste to replace it. This would extend the life of the landfill for the tribe and for cities like Scottsdale and Mesa.

Everyone thought it was a win-win. We got approved by the council of the tribe. The CEO we were dealing with then contracted cancer and unfortunately, passed away within a couple of months. This, as you know, means you start over with the Tribal Counsel and a new CEO.

This unfortunate event set us back tremendously because of the way Tribes do business. Tribal governments have elections like the U.S. Government every two to four years depending on the office you're filling. We didn't want to start over.

We then moved our efforts again, to a new site in Maricopa, Arizona, and began working on our third system. By the way, the first two Projects received funding approval, subject to

the completion of the development elements like land, feedstock, offtake, etc. We knew we could get it done if we found the right technology mix.

We moved to Maricopa. We had found that using [wood as a feedstock](#) offered additional benefits to the project profit picture by virtue of the fact that the U.S. Government was starting to pass bills around a new mandate from the Federal Government and the EPA called the [Renewable Fuel Standard](#), RFS. If developers meet the guidelines of the RFS and the buyers of the fuels produced can prove they are “renewable” by definition, the Government would give energy credits and money to the developers and or buyers of the fuel. These fuels emit much less harmful gases into the environment.



Wood, when buried, creates methane. A new law prevents companies who are builders or timber growers from leaving wood lying around on the ground, or from burying it in the ground in landfills. In Phoenix, there are two million tons a year of green wood waste that comes from parks, golf courses, and homes into landfills. These are landfills that the cities, Tribes, Republic Services or Waste Management control.

This was the same practice going on at the landfill the Tribe owned in Scottsdale. They were burying a lot of green wood waste and were being told to stop.

Now that this practice is outlawed a market opportunity for us has opened as there aren't any solutions being provided to these landfill operators as to where they are now going to put their wood waste. Cities and timber companies remove a lot of dead or fallen trees, trimmings, limbs, etc., annually. We are a great alternative to their problem.

We found a great piece of property with all the utilities we needed and proceeded to set up shop in Maricopa, having, everything going for us. Subsequently, meetings were held to generate the funding interest to begin the project. We had a buyer for the fuel which is a large, world-class refinery company called BP.

Unfortunately, it was proven by the Engineering company we hired to build the Project that the technology would not work as it was being represented to us by the Technology company.

At that point, we had a decision to make. Do we want to continue on this path, using these companies that we were dealing with that for one reason or another, could not prove their concepts or the output claims they were making or start over again?

Also, the wood providers had only been in business for five or six years and were producing \$30 million a year. You're not going to give them a contract for \$15 million a year for the delivery of wood when they don't have the equipment or the means of delivering it. No bank would be willing to fund the Project.

Economically speaking we couldn't prove out our model with the team of companies we assembled. So, we took time off. Almost 2 years.

What we then decided to do was to review the opportunity to find world-class partners in each segment of the industry. This included the front-end where you have feedstock that has to be prepared, loaded into some kind of gasification unit, gasified, the gas is fed into a [Fischer Tropsch](#), ("FT"), gas to liquid conversion system, and the liquid became a renewable designer diesel or jet fuel.

Then the gasification system we located and chose is a "second generation", proven technology. This technology, coming from a world-class company, did not exist five years prior.

Then, as the synthetic gas is created, which looks just like "natural gas" we use in our homes today, it is fed into the FT conversion system which takes the gas, cools it, and can then turn it into different kinds of liquid fuels or paraffins to be used in the plastics industry.

It's done every day but it hadn't been done with wood and hadn't been done the way we wanted to do it, up to this point.

We were fortunate to find a world-class industrial and technology company. This company has approximately 100 systems installed around the world, and they are one of the largest companies in this space. Not only do they design and build the systems, but they have second-generation technologies that they own or control and they guarantee the project will work, 100 percent.

No Engineering Procurement Construction, ("EPC") firm we worked with would do over a 50-60 percent guarantee, which makes it really difficult to fund your project. Now, we had the front-end, we had the 2nd generation technology with a proof-of-concept and proven

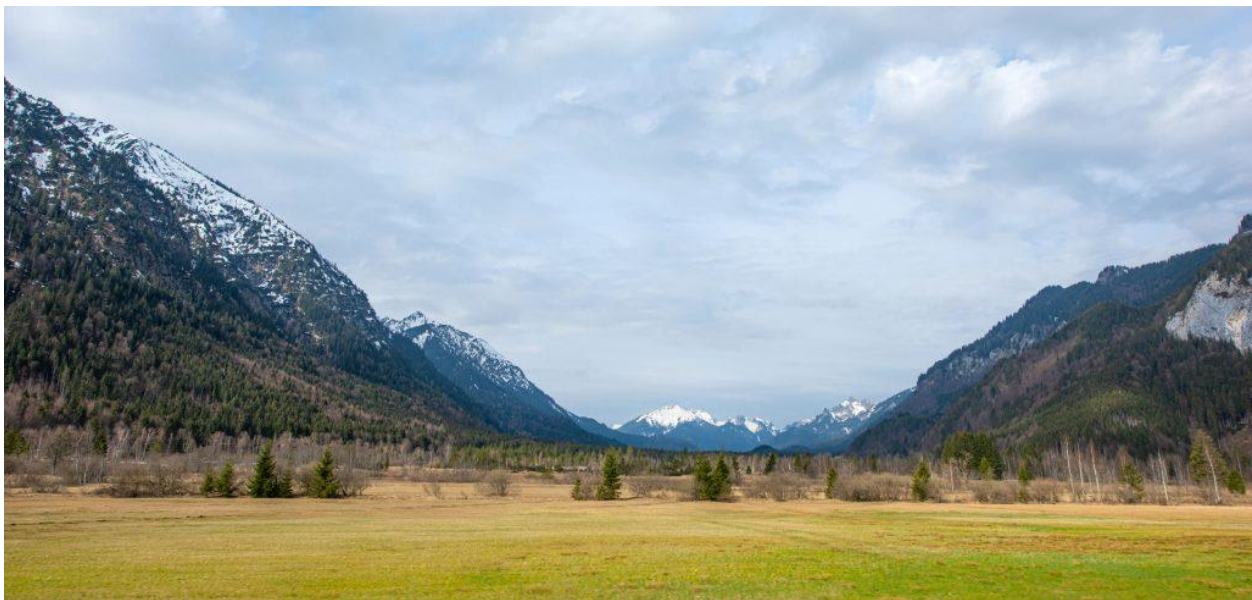
results and approximately a hundred installations around the world. No other company even came close to meeting these capabilities.

The EPC also had control and licenses for the back-end technology, which takes the synthetic gas from their gasification systems. The synthetic gas is then fed into the back-end system, cleaned, and converted into designer fuels with higher performance ratings near-zero-emissions, ultra-low sulfur, and ultra-low CO2.

These technologies are all proven. We now had the front-end, back-end, and middle synthetic gas cleaning process. What we had to find now was a world-class operator of the refineries that we were going to build, land to build it on and [woody biomass](#) feedstock to generate the synthetic gases.

We went back to the company that had been with us for the previous four years, which is the largest independently owned company in the world who operates about 160 refineries and utilities, both in the electrical and fuel industries.

They immediately got on board with us. So now we had the front-end, we had the operations, and we had the back-end.



We now had to find the woody biomass feedstock. We engaged one of the largest law firms in the country and determined the Northwest was our target market. In the Northwest, there are laws being passed, specifically in the states of WA and OR, that create a need and a desire for companies like ours to develop projects in those areas. The area that we have selected to go into for our first project is classified as both a Distressed Opportunity Zone and a New Market Tax Credit Zone.

What that means is, there's a lot of people out of work from the sawmills that have closed down. It's also a new market tax credit area so it invites investment. Then, in order to complete this whole cycle of taking the wood from cradle to grave, not only do the [trees have to be replanted](#) that you're using to create this fuel, but you also have to prove that they're being replaced. If you don't, you lose any of the credits being made available to

developers like NWABF for using woody biomass suppliers that follow the letter of the law on reforestation. It's a whole cycle they call a pathway, and they call the whole process sustainability.



[Airlines became our target markets](#) for our fuel. Airlines will not buy fuel from any fuel supplier that can't prove that they are 100 percent sustainability compliant, which means they have to have pathways that have proof of where the woody biomass comes from.

You must show that the entire ecosystem is also sustainable for the following criteria:

- how the woody biomass that resource management companies take is being replaced
- how the woody biomass gets delivered using barges or diesel trucks
- how much fuel is used to deliver the woody biomass
- how much carbon goes into the air because of the delivery process.

What NWABF ended up doing was finding the perfect piece of land, which is on the water in the Northwest and has deep port access, (one of only two sites on the West Coast besides San Francisco to have this deep of ports). It has docks that are hundreds of feet long already existing and plenty of space to store timber. The Project will be using a million dry tons a year of woody biomass.

Every day, about 5,000 wet tons or 2,600 dry tons of woody biomass cleared from the State's forests, will be delivered to the Site. It's a lot of wood. We will store extra woody biomass for certain periods if something happened and the feedstock deliveries can't get through to us.



[NWABF](#) will have the ability to verify the pathways and prove the sustainability concept to be compliant.

The local Native American tribe, the Quinault Nation, is just a few miles away. The Tribal Nation owns 230,000 acres of wooded forest. The company that has subcontracted the removal of all the Tribe's invasive species and the wood that's dying, the thinning wood from the reservation, as well as the wood they're removing for timber operations to make construction timber for housing, etc. will supply part of what the Project needs.

All of the scraps, all of the treetops, all of the bark, all of that kind of woody biomass will come from a Native American tribe's forest nearby the Project.

All of this woody biomass is traceable. From all of our suppliers, the wood is traceable from the time the tree was planted, all the way to the point where it goes into our gasification system. This is a serious statement.



That tree gets replaced, which is all verifiable and documented. When we prove this, we will have met all the conditions for funding. We've met all the conditions for sustainability, and we've met all the technological conditions to make a better fuel than what's being used in our airplanes today.

Our barges have direct access to California, where the airline that's agreed to buy our fuel for over a ten-year period, with a five-year renewal, wants to take a large portion of the fuel we're going to create in that harbor.

We have now amassed a partnership arrangement with companies that total almost \$300 billion in annual sales. We have become a fundable development Project.

We utilize compliant technology that's fully guaranteed to perform and meet all the requirements of the Federal Government's fuel standards and the airline's fuel standards worldwide.

We even have graphs that guarantee the delivery of the fuel so that the airline that's buying the fuel always knows that they're going to get at least 95 percent of their expected deliveries on a monthly basis.

NWABF is the only company of its kind that has what I just stated in the industry to our knowledge, to date. That's how the whole thing got started.

If you have an interest in discussing the merits of our Project, please contact us at info@nwabf.com.



About the Author

David P. Smoot

Mr. Smoot has an extensive business background covering almost 45 years, starting with his honorable discharge from the U. S. Army Reserves. Mr. Smoot spent 20 years in the micro- computer hardware and software industries, where he held positions as Director of Operations for Digital Research in Pacific Grove, CA, working with IBM Boca Raton and Intel, as well as senior positions with Informix, a database software company prior to Digital Research, (DRI), as it was known.