#BuiltWithBiology

California's Biostrategy 2020:
The Greenprint for Biomanufacturing and Sustainable Supply Chains in a Post-COVID World

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“We are the birthplace of biotech,
we have been on the leading and cutting edge...”
“But we have not necessarily seen the manufacturing… I’m here
… to make the case for the entire state of California, particularly as it relates to synthetic biology.”

Gov. Gavin Newsom, speaking via video to SynBioBeta 2019

About this report

This report has been created for Governor Gavin Newsom’s Business Recovery Task Force in response to the COVID-19 crisis, along with the rising unemployment and regional supply chain instabilities impacting the State of California. It provides concrete actions that California government leaders can take to create a prosperous, sustainable and innovative Californian bioeconomy for all, for the next 50 years and beyond. The report was drafted in consultation with over 100 leading entrepreneurs, investors, startups, large and small corporations, scientists and engineers, and input from the Lawrence Berkeley National Lab, the Engineering Biology Research Consortium, and the advocacy organizations the Californian Life Science Association (CLSA) and the Biotechnology Innovation Organization (BIO).

Introduction

California has unique combined strengths in bioengineering, higher learning, industry, investment, and entrepreneurship. We have the labs, people, and know-how to save California lives and livelihoods while leading the world through the COVID-19 crisis. Now is the time to apply our biomanufacturing potential and reimagine our supply chains by using biology to make medicine, food, materials, and more. As much as 60 percent of the physical inputs to the global economy could be produced biologically, and our ability to read, write, and edit DNA is already poised to transform our economy just as the computer revolution did, potentially adding $1 trillion to California's annual GDP in the decade ahead. California can lead the world and show that sustainable, even carbon-neutral manufacturing is not only possible, but profitable too. Biomanufacturing could be the state's biggest growth opportunity if its fledgling technology sectors are supported.

California's biobased economy has strong potential, with the agriculture sector alone generating $50 billion a year directly and creating over $100 billion of economic activity across the supply chain. With the post-COVID new emphasis on more local production chains, sustainable technologies could increase California's agriculture sector to four times this size, using technologies like biomanufacturing from ag waste, fermentation, offshore aquaculture, and increasing the infusion of modern technology. This would give Californians a $150 billion stimulus and wage security for over 1 million workers.

Here are three specific policies for California to rethink and rebuild our economy using biomanufacturing as the engine. These are strategic preparedness policies that will help California build secure supply chains and manufacturing capacity in the face of the current pandemic as well as future crises. Rather than retreating on the environment, they accelerate our commitment to renewable energy, sustainable goods, and clean water and air. They create a flexible and resilient bioindustrial base that can rapidly respond to future crises like disease, drought, fire and earthquakes, and form a multi-skilled workforce that will help our state thrive, both in good times and bad.

Policy Recommendations:

1. Create a California Biopreferred Stimulus Program
2. Establish a Biomanufacturing Investment Promotion Agency
3. Educate and engage the workforce of the future

1. Create a California Biopreferred Stimulus Program

Building sustainable supply chains to foster a resilient bioeconomy

As California's biomanufacturing industry builds the infrastructure to rapidly make a range of bio-based goods now and in the future, it will benefit from market incentives that encourage manufacturers to use sustainable goods in their supply chains. This is a straightforward mechanism to generate **new jobs**, develop **new markets** in a large number of sectors, and **spur innovation** by creating market certainty.

1. Introduce a **California BioPreferred Program** (based on the USDA Biopreferred Program created by the 2002 Farm Bill, which can be expanded for CA). Procurement of biobased products in California by state agencies (mandatory) and private sector leaders (voluntary & incentivized) can quickly and strategically drive the California bioeconomy.
    a. State agency mandatory procurement of biobased products: USDA has identified 30,000 biobased products for sale, many of which are from the 60+ California companies that produce them. State agencies should be required to set biobased procurement targets (e.g., 30% by 2030) and to purchase bio-based products.
    b. Private sector biobased manufacturing leadership incentives: Leading influential Californian companies such as Tesla, Apple, Google, should be fiscally incentivized to include a certain proportion of renewable biobased, California-produced materials or chemicals in their products. This would reduce the environmental impacts and stimulate jobs in the California economy.
2. As funds become available, provide **California BioPreferred** seed grants of $25-100K to Californian manufacturing companies who will analyze, plan, and convert their supply chains and product roadmaps via California BioPreferred products.
3. Introduce a new **'Made with California DNA' certification** program to publicly validate and promote companies that biomanufacture within California.

Impact

The **Biopreferred Program** could generate an additional **$500M of domestic economic activity.** In the near term, these actions would boost sales of California based products, allowing the companies making them to **retain and hire more staff**. In the medium to long term, this direct and indirect support would help these organizations **develop new products, expand operations, and attract investment**.

Actions and Resources Needed Now

1. Establish a blue ribbon panel to develop a California Biopreferred Program
2. Set up California Biopreferred Portal, product analysis, certification program, and product catalog
3. For Californian manufacturers, facilitate supply chain analysis and conversion to biopreferred

2. Establish a Biomanufacturing Investment Promotion Agency

Bringing together industry leaders, investors, and policy makers to promote a California that is "Built With Biology"

The coronavirus outbreak of 2020 has made our relationship with biology painfully obvious, but few realize how important a role biology already plays in our daily lives, from the clothes we wear to the foods we eat to the medicines we take. To realize the trillion-dollar potential impact of biomanufacturing in California in the coming decade, we must raise public awareness for the coming bioeconomy and explore how biology can create new industries that serve our citizens and planet in a more sustainable manner. We propose that the State launch a Built With Biology Initiative with the following steps:

1. Assign a biomanufacturing liaison inside the Governor's Office of Business and Economic Development and establish a biomanufacturing investment promotion agency to recruit biomanufacturing businesses, investment and establish new partnerships with the manufacturing sector.
2. SynBioBeta will host the inaugural **Built With Biology Digital Summit** in **Q2 2020**, bringing together the biotechnology industry, investors, government officials, and manufacturers to reimagine how California supply chains could be built with biology.
3. Support an ongoing **Built With Biology** digital conference to promote investment, awareness and leadership in California biomanufacturing.
4. Convene a **quarterly Built with Biology Roundtable** at the Governor's Office to review progress and discuss new opportunities.
5. Commission a **Built With Biology** report to analyze current supply chains and recommend how companies can rebuild them more sustainably and develop long-term biostrategies.
6. Define the scope for a series of **Biomanufacturing Opportunity Zones**, including a plan for seeking federal stimulus funding to support the development of five biomanufacturing pilot plants to fill gaps in California manufacturing ecosystem and supply chains.
7. As funds may become available, create a **Bio-Bridge Matching Fund**, available to biomanufacturing startups and applicable as convertible notes.
8. Commission a "digital backbone" to coordinate data and activities between research labs and manufacturing facilities.

Impact

The Built With Biology program would bring the biomanufacturing, traditional manufacturing, and government communities together to address COVID-19 as a symptom of much bigger problems we are not yet prepared to deal with, including the effects of climate change, future pandemic preparation, and the countless health and welfare issues we face with the current population growth projections.

Actions and resources needed now:

1. Assign a point of contact within the Governor's Office of Business and Economic Development to coordinate quarterly meetings at the Governor's office

3. Educate and engage the workforce of the future

Built With Biology's overarching goal is to ensure that California becomes the #1 place in the world for training and innovation in biomanufacturing. Here are some economical programs we can take that will have an enormous return on investment.

Teaching resources for California high school and university biology programs: The biomanufacturing industry expects to create 100,000 jobs over the next decade. To prepare the next generation of green-collar workers, we need to introduce more courses that prepare them for all kinds of jobs in the bioeconomy. Built With Biology would explore a video-based lecture series for biomanufacturing curricula that would be available to all California schools for free. With the world's best biotech professors giving the lectures, local teachers can focus on assignments and lab work. We will provide each school with a "Master Class" approach to biomanufacturing, which will free teachers to prepare assignments, increase lab time, and provide individual attention to each student.

World-class virtual labs: Students need greater access to the cutting edge tech, robots and computational capacity that will allow them to realize their creativity and the potential of modern biotechnology, yet budgets for such resources are being cut. Built With Biology will help develop a Virtual Lab with industry leaders in the emerging "cloud lab" sector to enable students and adult learners to interface with state-of-the-art resources from anywhere in the state. These virtual labs could also empower and engage minority, rural, and disenfranchised groups in the California economy through community labs.

Internships: We will develop a network of employers committed to providing students and adults with new opportunities in the bioeconomy.

Awareness: We propose that California immediately launch a series of bioeconomy awareness programs to increase awareness of the bioeconomy and its potential in our economic and environmental future. These will aim to inspire students and adults to pursue learning and careers in the bioeconomy, and unleash the creative potential of a new generation of "bioimagineers".

Impact

This would increase the competitiveness of California to ensure a workforce that can capture the $1T growth opportunity that the bioeconomy represents. It would foster a diverse bioeconomy workforce, invent sustainable methods of manufacturing, create jobs, and discover solutions to the environmental problems at the state and local levels.

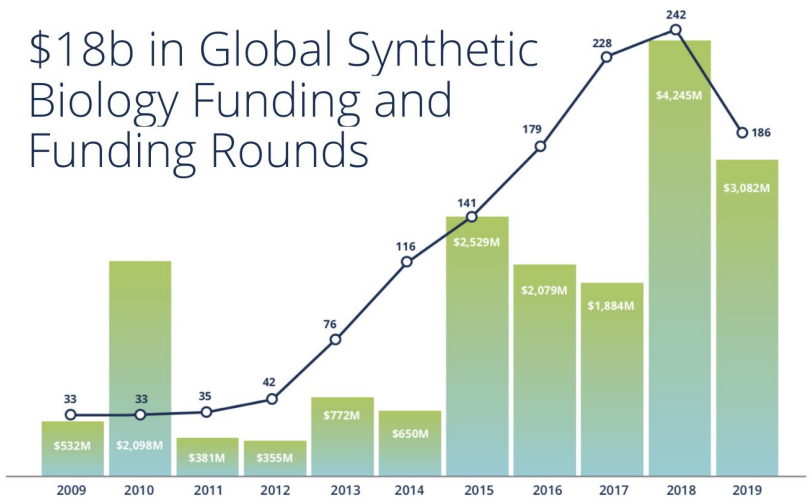
Actions and Resources Needed Now

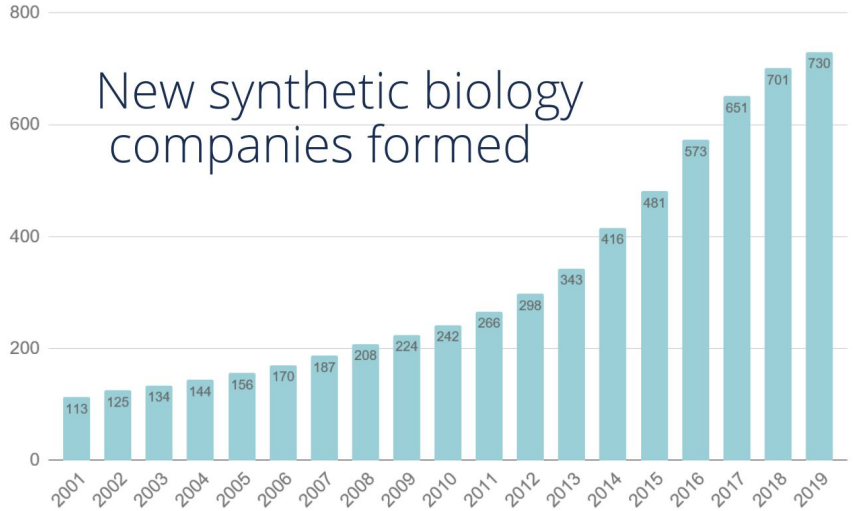
1. Coordinate biotech education resources across the state to collaborate on a Built With Biology curriculum, Virtual Lab and Bioeconomy Internship Program and engagement campaigns.

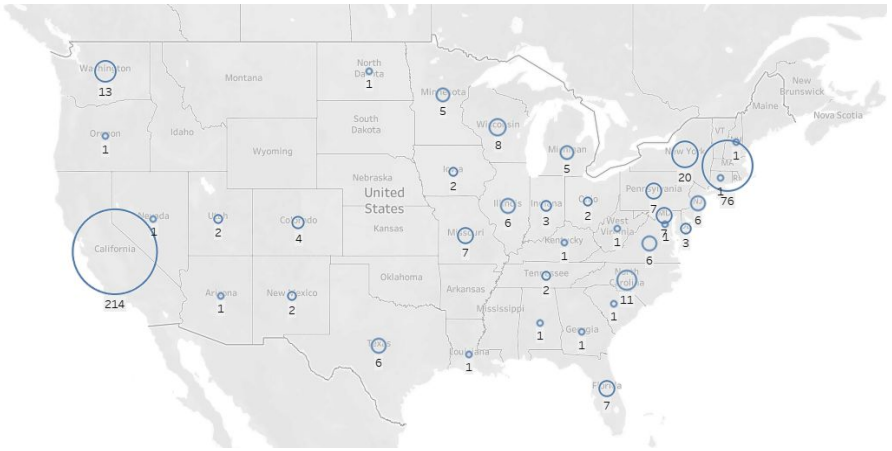
Summary

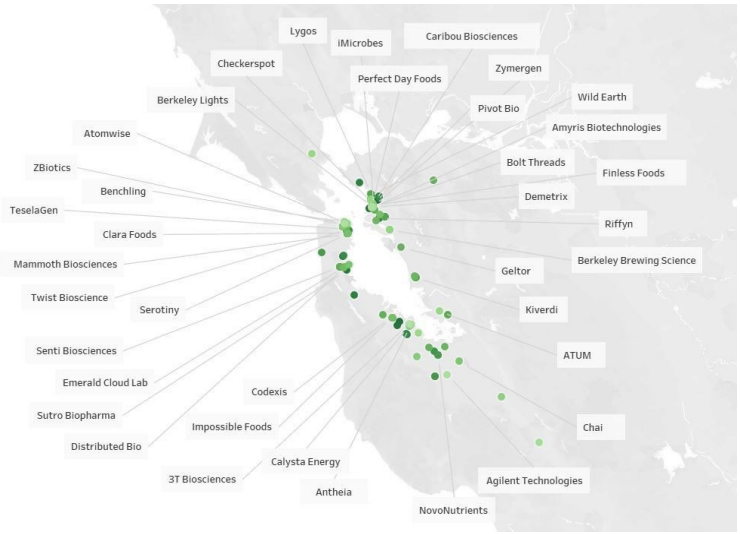
California has the opportunity to change the world for good, through our creative and courageous approach to biomanufacturing. The devastation COVID-19 has caused is a jarring reminder of the need to invest in proactive science and sustainable technologies. This proposal will not just prepare us for future crisis scenarios, but will be put to use in preventing them entirely. Built with Biology creates a bright future for California, one that gives our students the tools they need to succeed, provides our communities with the jobs they need to thrive, and sustains California as the birthplace of technology that shapes the world's future.

The synthetic biology sector has raised over $18B since 2009, with over 730 companies globally, led by California and the San Francisco Bay Area.









About SynBioBeta

SynBioBeta is the premier innovation network for biological engineers, investors, innovators and entrepreneurs who share a passion for using biology to build a better, more sustainable universe.

www.SynBioBeta.com

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