

## Addressing Renewables and Biofuels Challenges


The global energy industry is experiencing an unprecedented transformation. Historic regulatory and environmental mandates have now been supplemented with investor imposed sustainability requirements and corporate “green” initiatives. The energy industry’s mindset must now evolve from “should we?” to “how will we?”. Refiners and petrochemical organizations need to quickly develop investment and operational strategies to meet these targets while maintaining shareholder value, enterprise economic viability, and safe and reliable operation. All parts of the organization, including Operations, Maintenance, Reliability, Engineering, Finance, and Planning, as well as the asset itself, have to change and be modified, and with no time to lose. Given that <10% of projects meet the capital cost, schedule, and performance objective trifecta, operating companies must challenge historical project approaches to avoid similar outcomes.

Becht welcomes this challenge and has over 1,500 technical and strategy subject matter experts, proven methodologies, and efficient tools to support clients in responding to this transformation. Becht’s mantras of “Get It Right the First Time” and “Go Slow to Go Fast” are applied in collaboration with clients to attain capital efficiency and meet business objectives. From the initial conceptualization phase, through basic and detailed engineering, and on to construction and commissioning and beyond, Becht can be the trusted advisor to provide laser focused support from an Owner / Operator perspective and an independent, technology agnostic mindset. The Becht organization has spent 40+ years supporting the energy industry’s evolution and is passionate about supporting the industry through this transformation.

Feasibility	Appraisal
<p style="text-align: center;"><b><u>Feasibility Stage Challenge</u></b></p> <p><b><i>What is the right strategy for our facility to meet renewables mandates?</i></b></p>	<p style="text-align: center;"><b><u>Becht Solution</u></b></p> <p>Becht’s Strategic Consulting team works with clients to develop strategies and investment options during conceptual design. The goal is to prepare an investment quality package for management and investors that meets economic and technical feasibility. Projects include inside facility options and external renewable synergies, such as H<sub>2</sub>, wind, and solar. Working with Becht, clients confidently get approval for engineering / implementation of a renewables strategy while avoiding regret capital.</p>
<p style="text-align: center;"><b><u>Appraisal Stage Challenge</u></b></p> <p><b><i>How much biofeed(s) can my facility economically process and what ISBL / OSBL investments are needed?</i></b></p>	<p style="text-align: center;"><b><u>Becht Solution</u></b></p> <p>Becht helps analyze facility capabilities for existing and greenfield designs by combining process simulation, linear program, and subject matter expertise on process, energy, and mechanical elements. The key consideration is to start from an optimized case, where the existing assets are utilized to the maximum extent before modifications are considered. Then, a roadmap of capital projects can be prepared and examined in an integrated way, both technically and economically, including process integration, energy system impacts, and logistic requirements. The realized benefits for engagement of Becht are typically 30 to 50 times professional fees, depending on project complexity.</p>
<p><b><u>Case Study</u></b></p> <p><i>A Biofuels Innovation Company developed a new / stepout Biofuels process. Becht was engaged as part of a team of process licensors, process developers, and investors to assess the technology. Becht supported early planning studies, preliminary cost estimates, heat and material balance and process flowsheet preparation and review, and equipment design specification definition. This involvement helped the Innovation firm confirm mechanical and capital feasibility.</i></p>	

 Engineering Solutions  
Bringing the Owner's Perspective

 Plant Services  
Delivering Expertise to the Field

 Software Tools  
Leveraging Technology

 Learning & Development  
Maximizing Your Workforce's Capability



## Selection

## Definition / Design

### Selection Phase Challenge

**What process technologies are available and how do we ensure the right one is selected?**

### Becht Solution

Technology options to meet renewables mandates and enable biofeed processing continue to evolve. Becht works with clients and vendors to prepare consistent technical process design basis from an integrated representation, which streamlines and improves evaluation and selection of the right technology options. By combining process, mechanical, and reliability expertise, Becht assists clients to assess and mitigate technology and operability risks, such that the resultant asset meets processing and flexibility objectives while efficiently employing capital. Becht's involvement is inexpensive insurance on the final asset's capabilities.

### Case Study

*A European client co-processing bio-based feedstocks with traditional refinery distillates in a hydrotreater was experiencing significant corrosion and issued and engaged Becht to assist. Becht collaborated to identify potential corrosion root causes and triage mitigation recommendations in design, metallurgy, and operations to address the problem. The client implemented the changes to capture the bio-processing profit margin and blending credits.*

## Project Management and Execution

### Project Management Challenge

**Does our organization have the expertise and capacity to execute these projects?**

### Becht Solution

Becht's seasoned Project Professionals can assist with everything from Owners Oversight to Planning and Strategy reviews to technology and support. We provide oversight services by utilizing our advisors to perform thorough planning, strategy, gate, and cost reviews to give you assurance the project is on the right track. We have experienced Heavy Lift experts who will provide planning and oversight assistance. Becht's Human Performance team can provide highly effective operations, maintenance, and technical training and support for your organization throughout the start-up of the unit. Finally, Becht can provide supplemental personnel with expertise in any area to hit the ground running in supporting your project organization.

### Case Study

*A major Caribbean Refinery was undertaking a substantial, \$1Bn expansion effort to revamp the process to support a more advantaged crude slate. Becht was initially engaged to assist with a review of the commercial terms and contracting strategies. We provided practical recommendations that would improve contractor selection, reduce project risks, and provide the owner tangible milestones to oversee the contractors. As the project moved forward, Becht employed a diverse array of experts in refinery process technologies to perform Quality Assurance on the Front End Engineering Design (FEED) packages for each processing unit included in the revamp effort. Becht served as the owner's engineer throughout the engineering stage to ensure best practices were incorporated in equipment design and operation. Becht utilized its vast pool of deep refinery process and mechanical expertise to help the owner ensure they spent the minimum amount of Capital to produce the greatest gain.*

### Conclusion

As the energy industry strives to evaluate and implement asset and organizational changes required to meet renewables and bio-processing requirements, Becht provides extensive process, mechanical, reliability, projects, and capability development expertise to support this initiative. Becht's proven track record helps clients achieve safe, reliable, and profitable operations while increasing return on investment and shortening overall implementation timing.

