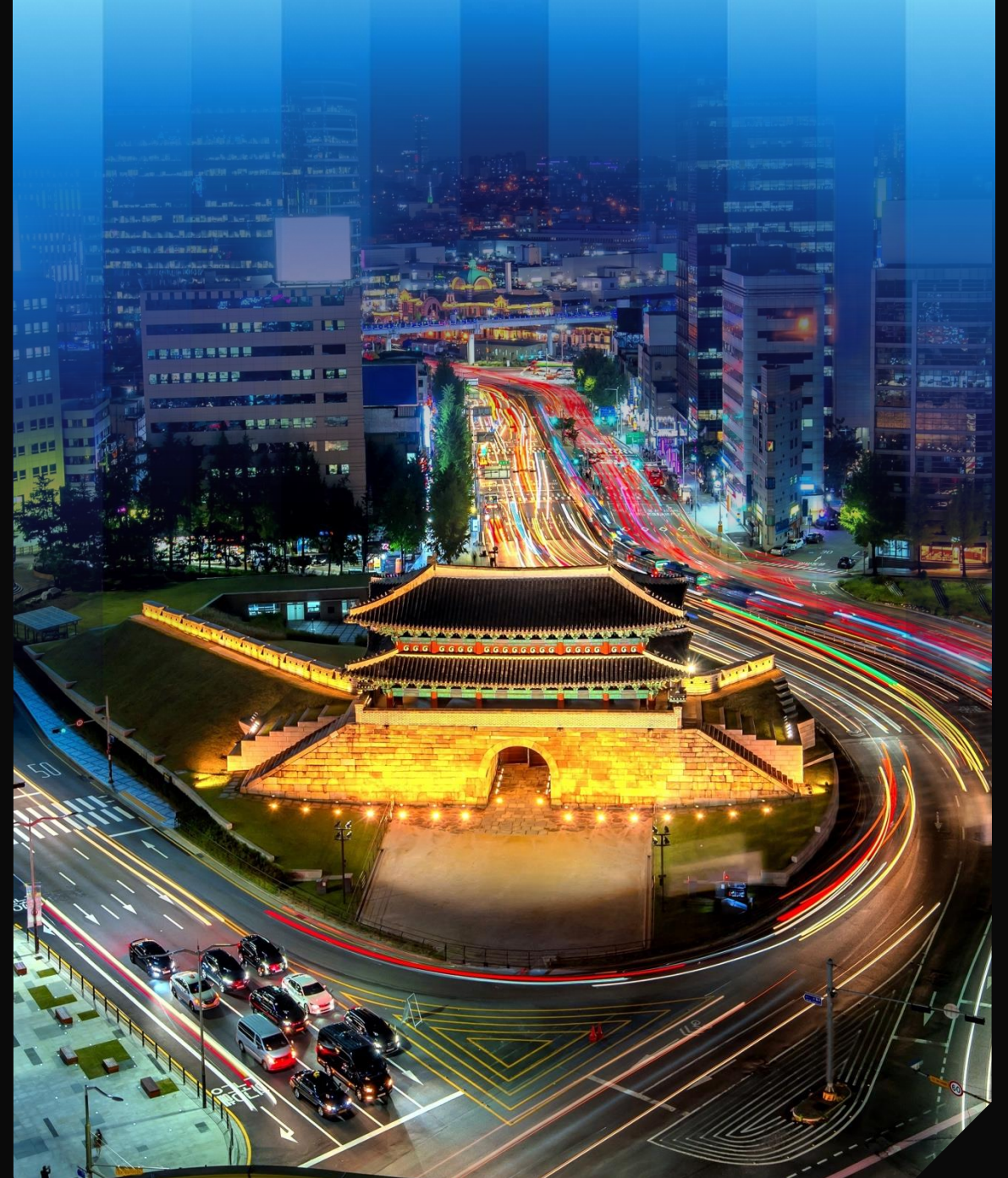




Case Studies Across Industries

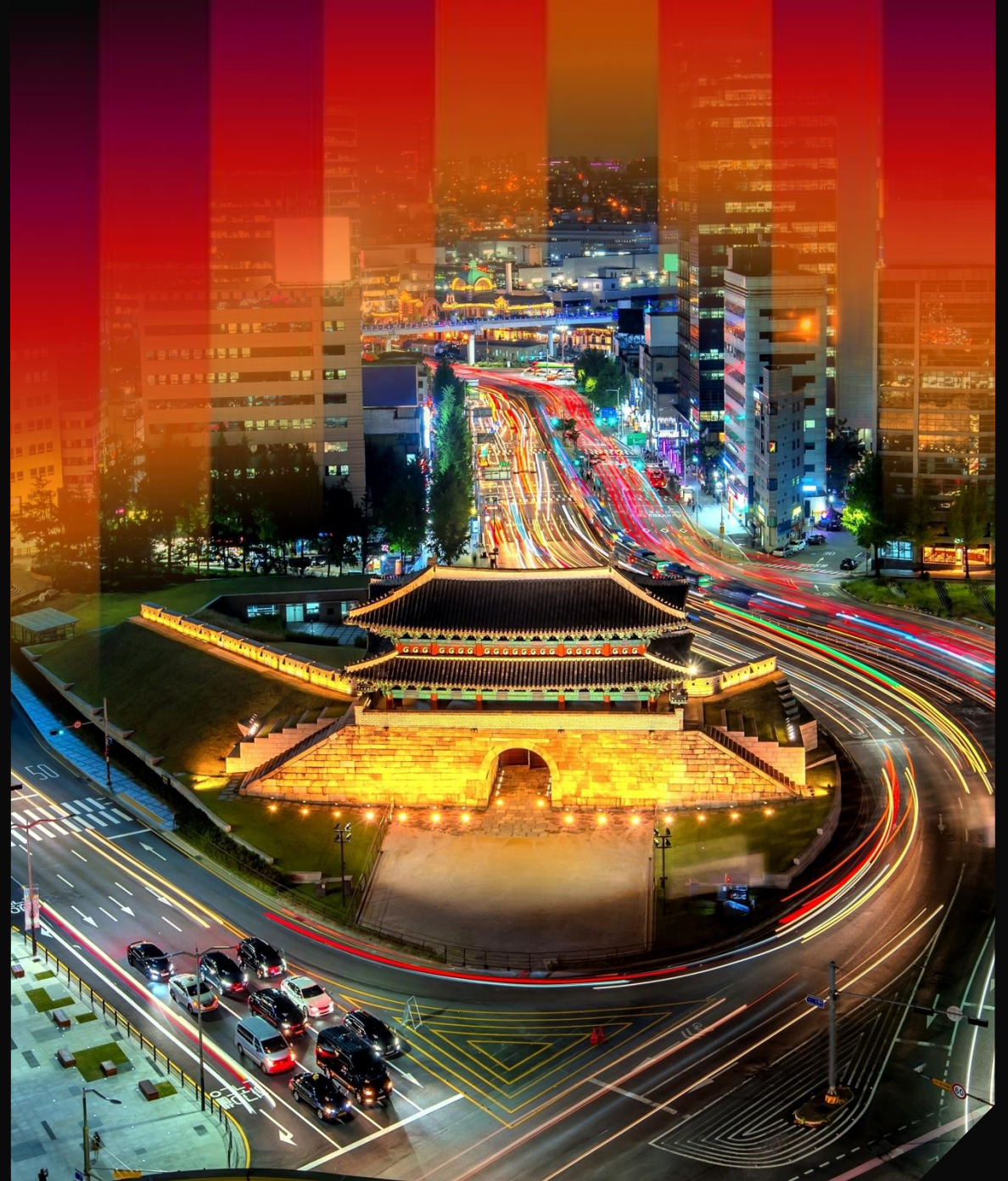


Chung-Kyun Han
Technical Account Management - APAC



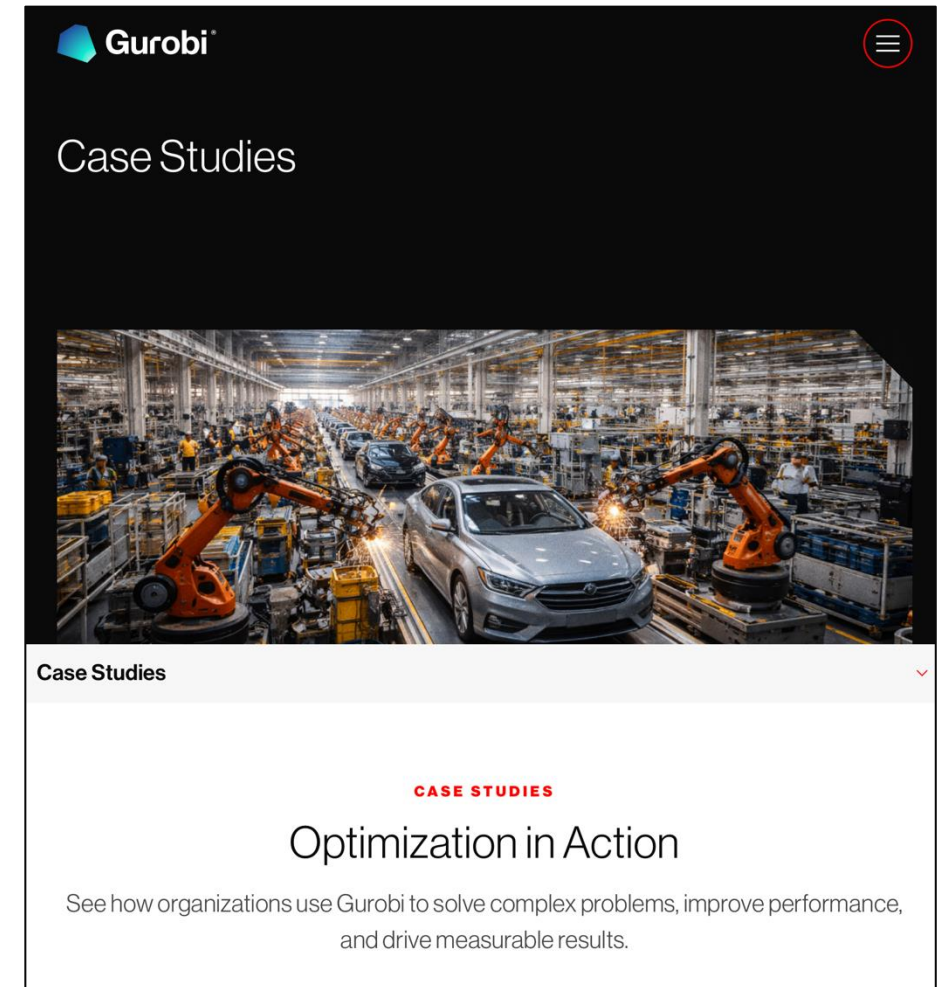
Agenda

- 01 Global Footprint & Industry Distribution
- 02 Industry Overview
- 03 Case Study Analysis



Use Cases & Customer Case Studies

- Advertising and Marketing
- Aviation
- Automotive
- Chemicals & Petroleum
- Consumer Products
- Continuous Production
- Finance & Banking
- Food & Beverage
- Government
- Healthcare
- Industrial Automation and Machinery
- Manufacturing
- Metals, Materials, and Mining
- Power and Utilities
- Pulp and Paper
- Research
- Semiconductor
- Software
- Sports and Recreation
- Supply Chain
- Telecommunications
- Transportation
- Workforce Scheduling



https://www.gurobi.com/case_studies

3

Use Cases & Customer Case Studies

Tackling One of the World's Most Complex Scheduling Problems

The NFL quickly identifies the best possible game schedules—driving revenue while delighting audiences.

From Boards to Computers

The NFL's professional American football league has 32 teams and the highest professional salaries in the world. It's a complex scheduling problem with many constraints, when every game is a revenue-generating event. The NFL is a professional American football league with 32 teams and the highest professional salaries in the world. It's a complex scheduling problem with many constraints, when every game is a revenue-generating event.

Results

- Identified the best possible game schedule for the NFL.
- Reduced the time to generate a schedule from weeks to days.
- Improved the quality of the schedule, resulting in higher revenue and fan satisfaction.



Mastering Supply Chain Challenges Through Complex Scenario Planning

Gurobi helps SAP deliver a powerful planning solution for today's challenges.

What SAP Needed

The SAP team needed a solution that could handle the complexity of their supply chain planning, including multiple scenarios and constraints. They needed a tool that could optimize their supply chain across various scenarios and constraints.

Results

- Improved supply chain planning efficiency.
- Reduced the time to generate a supply chain plan.
- Optimized supply chain costs and improved customer service.



Maximizing Profitability While Ensuring Environmental Compliance

Toyota generates optimal compliance scenarios in minutes.

Results

- Optimized Toyota's production process to maximize profitability while ensuring environmental compliance.
- Reduced the time to generate a compliance scenario.
- Improved Toyota's environmental performance.



Selecting Optimal Project Portfolios

HP-Global generates 90% of the portfolio benefit with 24% of the portfolio cost, driving a \$100 million financial benefit versus manual processes.

Results

- Optimized HP-Global's project portfolio to maximize financial benefit.
- Reduced the time to generate a project portfolio.
- Improved HP-Global's financial performance.



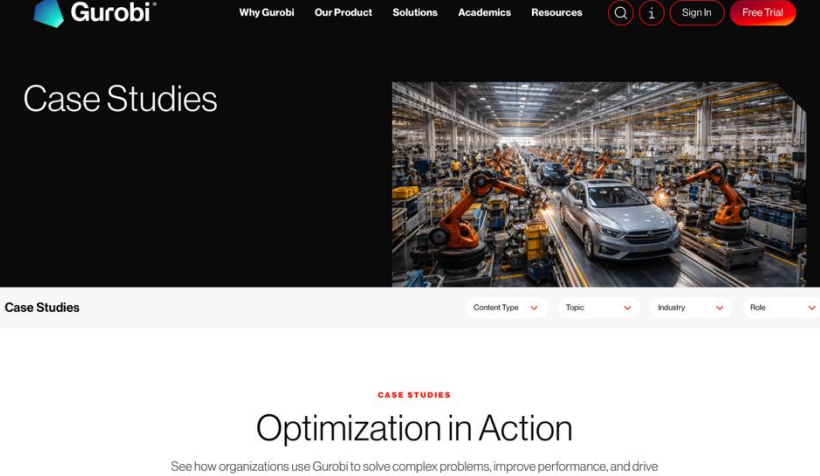
Case Studies

Optimization in Action

See how organizations use Gurobi to solve complex problems, improve performance, and drive measurable results.

Case Studies

- Eneco: Harnessing Optimization for Smarter Energy Dispatching
- Kurly: Transforming Delivery Logistics with Mathematical Optimization



Building the Most Efficient Tail Assignment Schedule

Air France saves around 1% on fuel costs annually on top of what they thought was an optimal fuel bill.

Results

- Optimized Air France's tail assignment schedule to reduce fuel costs.
- Reduced the time to generate a tail assignment schedule.
- Improved Air France's operational efficiency.

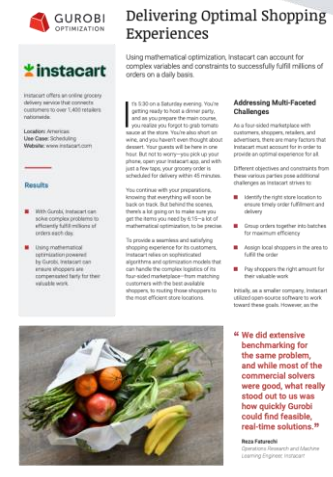


Delivering Optimal Shopping Experiences

Using mathematical optimization, Instacart can account for complex variables and constraints to successfully fulfill millions of orders on a daily basis.

Results

- Optimized Instacart's shopping experience to improve customer satisfaction.
- Reduced the time to fulfill orders.
- Improved Instacart's operational efficiency.




Optimizing Driver Incentive Plans and Adapting to Market Changes

With Gurobi's solver, Lyft can develop optimal incentive plans that influence positive market outcomes for both drivers and riders.

Results

- Optimized Lyft's driver incentive plans to improve driver satisfaction.
- Reduced the time to generate an incentive plan.
- Improved Lyft's market performance.



Creating Optimal Product Mixes for Each Day's Unique Dairy Supply

With help from Gurobi, Fonterra uses their new planning model to sustainably produce nearly a third of the world's dairy supply.

Results

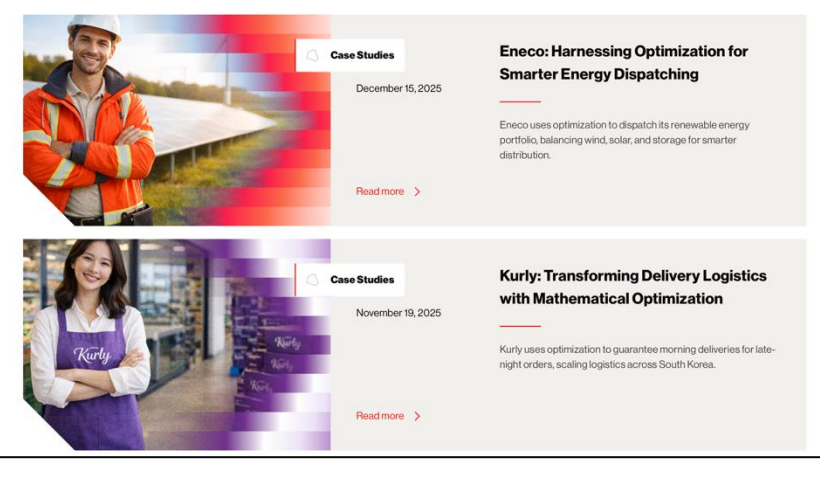
- Optimized Fonterra's dairy product mix to improve sustainability.
- Reduced the time to generate a product mix.
- Improved Fonterra's operational efficiency.



Case Studies

Eneco: Harnessing Optimization for Smarter Energy Dispatching

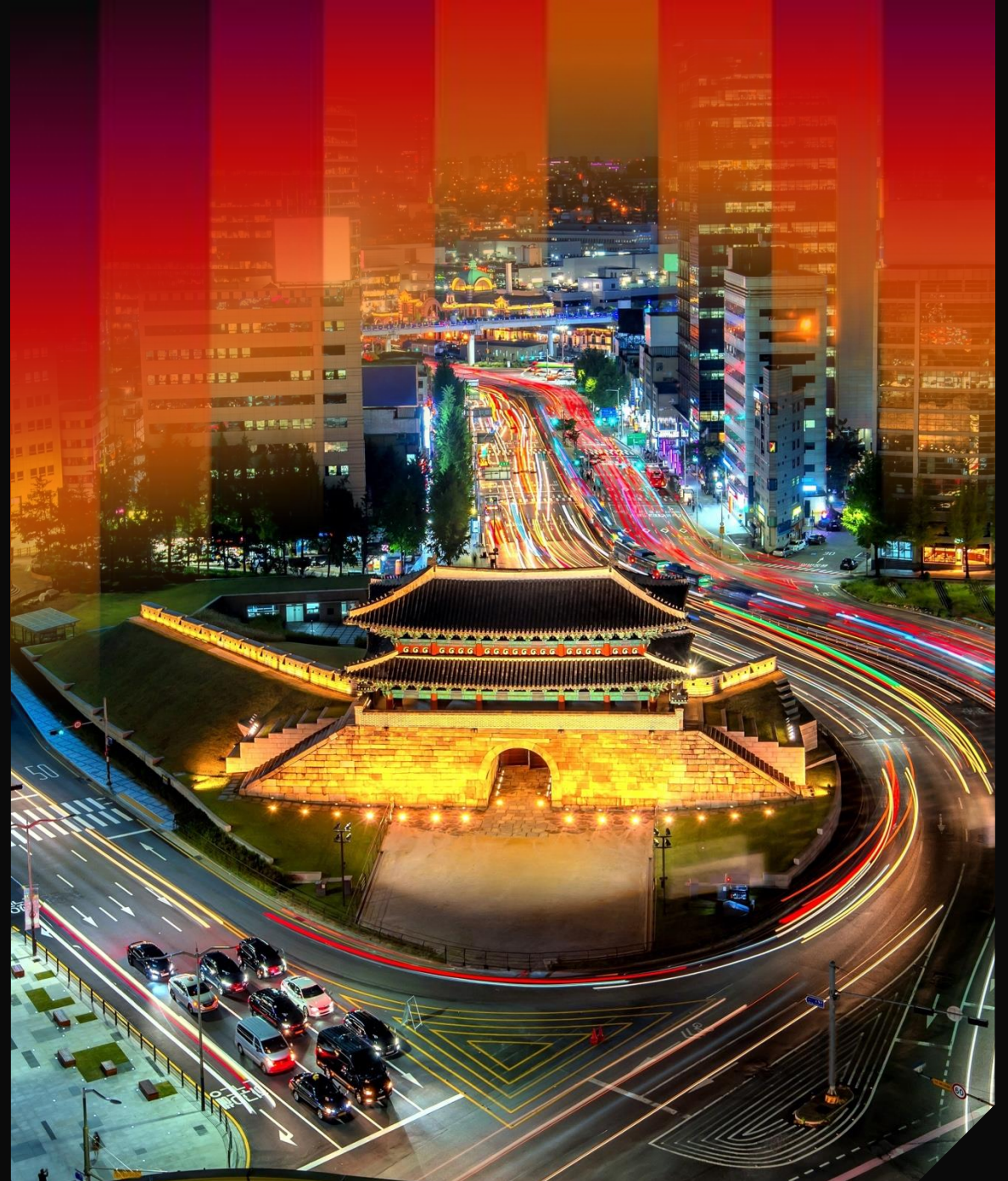
Kurly: Transforming Delivery Logistics with Mathematical Optimization



https://www.gurobi.com/case_studies

... 100+ case studies

Industry Overview



Energy / Power & Utilities

GLOBAL ENERGY / POWER & UTILITIES ECOSYSTEM

From long-term investment to real-time dispatch — optimization across every energy decision

Decision Horizon	Strategic Investment	Operations Planning	Short-term Dispatch	Real-time Trading
Description	Capital investment planning for resilient, low-carbon infrastructure	Balancing generation, hydro, and renewables across seasonal horizons	Optimizing which assets run, when, and how much — hour by hour	Maximizing revenue and managing risk in volatile energy markets
Application	<ul style="list-style-type: none"> Capacity Expansion Network / Grid Design BESS Feasibility Resilience Planning 	<ul style="list-style-type: none"> Generation Planning Water Resource Opt. Maintenance Scheduling Renewable Balancing 	<ul style="list-style-type: none"> Unit Commitment Hydro Scheduling (Short-term) BESS Dispatch DER Management 	<ul style="list-style-type: none"> Energy Market Trading Bid Price Optimization Portfolio Risk Management
Case Studies	Statkraft (BESS) / Quanta (Grid) / RWTH (Multi-energy) / RITE (Carbon policy) / encoord (Network)	TEA / Alpiq (Hydro) / J-POWER (Renewable) / Water Corp. / Tokyo Metro Univ. (Water Supply)	AMS (BESS) / Alpiq (Hydro) / Polymathian VOLT / Ogimoto Lab / Eneco (VPP)	SESCO / Avista

Retail & Consumer

Optimization you experience as a consumer every day — from pricing to your doorstep

Stage	Assortment & Curation	Pricing Optimization	Mktg. & Engagement	Operations & Fulfillment
Description	Deciding which products to offer to which customers	Setting prices that maximize revenue across products and time	Targeting the right customers with the right message and budget	Executing orders, assigning shoppers, and scheduling staff for efficient fulfillment
Application	<ul style="list-style-type: none"> Product-Customer Matching Optimization Subscription Service Curation 	<ul style="list-style-type: none"> Dynamic Pricing Markdown / Season-end Optimization Real-time Grocery Pricing 	<ul style="list-style-type: none"> Email Campaign Optimization Online Ad Bidding Optimization 	<ul style="list-style-type: none"> Order Batching Optimization Shopper Assignment Workforce Scheduling
Case Studies	Birchbox (Princeton Consultants)	Blue Yonder / Luca / Veltys	Emesa / BrainPad (October Sky)	Instacart / Kurly / Workforce Analytics

Supply Chain & Logistics

From network design to last-mile delivery — optimization across the entire supply chain

Decision Horizon	Strategic: Network Design	Tactical: Supply & Inventory Mgmt	Operational: Transportation Execution	Special Applications
Description	Where to locate facilities and how to structure the supply network	Balancing supply with demand across time, location, and uncertainty	Routing vehicles and deliveries at minimum cost and maximum speed	Asset logistics and industry-specific end-to-end supply chain optimization
Application	<ul style="list-style-type: none"> • Facility Location • Districting & Territory Design • Global Supply Chain Network Optimization 	<ul style="list-style-type: none"> • Integrated S&OP • Multi-echelon Inventory Optimization • Supply Chain Risk Management 	<ul style="list-style-type: none"> • Vehicle Routing (VRP) • Last Mile Delivery Optimization • Transportation Planning Automation 	<ul style="list-style-type: none"> • Asset & Cash Placement • Mine-to-Market Optimization • Pharma Supply Chain
Case Studies	Kurly / Posten Bring / Suzano	SAP / Pharmaceuticals (ICRON) / Mars / Fonterra	Mondelez (Arute) / Lean Logistics (e2open) / Delhivery / Suzano	Arute Solutions / Wincor Nixdorf / Polymathian RACE / Polymathian BOLT

Before Gurobi: What Pushed Companies to Act

1. Manual Process Limits

- Audi 8 people, 3 weeks → seconds
- YOKU MOKU 600 hrs/yr plans → 1 day
- Yutong Bus 9-hour planning → 45 min
- KLM 1 scenario/week → 20–30/week
- Birchbox 30–50 hours matching → 10 min (99%↓)

2. Scale/Complexity

- SAP 20M → 1.7B variables
- NFL Schedule options: 5 → 10,000+
- 55ip 100,000+ portfolios/month
- Emesa Emails processed: 10K → 1M/week

3. Existing Solver Insufficient

- Hewlett Packard vs. open-source: 5,000× faster
- Water Corporation vs. open-source: 600× faster
- Arute Solutions vs. commercial solver: 190× faster
- Avista Utilities vs. commercial solver: 50× faster
- Fonterra Other solver: no solution found

4. Real-Time Processing

- Lyft Real-time incentives, 92%↓ solve time
- Instacart Millions of orders — uninterrupted
- Eneco VPP 10 min → 40 sec, 99.9% uptime
- Luca Real-time pricing: 30 min → seconds

Manufacturing

From raw materials to delivery — optimizing every stage of the production

Value Chain	Sourcing & Blending	Production Planning & S&OP	Shop Floor Scheduling	Sales & Distribution
Description	Getting the right inputs at the right cost before production begins	Aligning production targets with demand, capacity, and inventory	Sequencing jobs, machines, and materials on the production floor	Getting finished goods to customers efficiently
Application	<ul style="list-style-type: none"> Raw Material Blending Supplier Selection & Procurement 	<ul style="list-style-type: none"> Sales & Operations Planning (S&OP) Product Mix Optimization Demand-driven Production Planning 	<ul style="list-style-type: none"> Assembly Line Sequencing Job Shop Scheduling Cutting / Nesting Optimization 	<ul style="list-style-type: none"> Sales Route Optimization Production-Sales Alignment
Case Studies	Tata Steel / Aimpoint	Vestel (ICRON) / Toyota (October Sky) / Yutong Bus	Audi / Pentair / Kaneka / Kvaerner / YOKU MOKU CREA	Cosentino

Airlines & Aviation

The most mature industry in Operations Research — optimization at every altitude

Operations Domain	Fleet & Network Planning	Crew Planning	Airport Operations	Flight Training & Simulation
Description	Matching aircraft to routes and schedules over weeks and months	Assigning crew to flights within duty, rest, and qualification rules	Allocating airport resources and staff across daily operations	Scheduling pilot training on simulators under regulatory constraints
Application	<ul style="list-style-type: none"> • Timetable Planning • Fleet Assignment • Tail Assignment • Maintenance Routing 	<ul style="list-style-type: none"> • Crew Pairing • Crew Rostering • Annual Vacation Scheduling • Long-term Workforce Planning 	<ul style="list-style-type: none"> • Resource Allocation (Gate, Stand, Check-in Counter) • Ground Operations Scheduling (Staff & Handling) 	<ul style="list-style-type: none"> • Simulator Scheduling (Operational) • Pilot Training Planning (Strategic)
Case Studies	Air France	KLM (BCG) / Rosterize (crew scheduling ISV) / Hitit (airline IT vendor)	Copenhagen Airport / Geneva Airport (Eurodecision) / Swissport	Lufthansa Flight Training (Optano)

Financial Services

Where a 1% difference creates billions in value — optimization at the speed of markets

Business Domain	Institutional Asset Management	Capital Markets & Trading	Retail & Personal Finance	Financial Infra. & Operations
Description	Large-scale portfolio optimization under risk & regulatory constraints	Optimizing trade matching via combinatorial auctions	Personalized, tax-optimized financial planning for individual investors	Optimizing financial operations – from cash logistics to capital allocation
Application	<ul style="list-style-type: none"> Fixed Income Automation Private Banking Customization Risk/Regulatory Portfolio Opt. 	<ul style="list-style-type: none"> Order Matching Optimization 	<ul style="list-style-type: none"> Tax-Efficient Investing Retirement Income Optimization Withdrawal Sequencing 	<ul style="list-style-type: none"> ATM / Cash Management Enterprise IT / R&D Budget Allocation
Case Studies	Robeco / swissQuant	OneChronos	55ip (acq. by JP Morgan) / MyGoals	Arute Solutions / Wincor Nixdorf / Hewlett Packard

Beyond the Solver: Business Outcomes at Scale

Dollar-Value Impacts

\$20B

FCC (2018 Franz Edelman)
— Spectrum auction revenue

\$2.8B

Princeton / US Census
— Federal spending saved

\$100M+

Hewlett Packard
— Profit generated

\$70M+

Copenhagen Airport
— Investment savings

\$1.5M/yr

Metallurgical Additives
— Annual savings

\$1M/yr

Swissport — Scheduling savings

% / Social Impacts

Revenue +5%, Inventory -20%

Blue Yonder · Supply chain

Gross margin +15%

Polymathian VOLT · Energy / utilities

Portfolio return +1% (vs. commercial solver)

swissQuant · Asset management (AUM-leverage)

Revenue +12–25%

Statkraft BESS · Energy storage

~1,820 lives saved

Chilean Government · COVID medical resources (2022 Franz Edelman)

Transportation & Mobility

Optimization exists everywhere people and goods move — on rails, roads, and beyond

Operations Domain	Network & Infrastructure	Dispatch & Routing	Workforce Scheduling	Real-time & Platform Mobility
Description	Large-scale portfolio optimization under risk & regulatory constraints	Directing vehicles and drivers at minimum cost and maximum speed	Assigning transportation staff to shifts and routes within regulatory limits	Optimizing financial operations – from cash logistics to capital allocation
Application	<ul style="list-style-type: none"> • Train Operations Planning • Airport Infra. Planning • Urban Air Mobility Network Design 	<ul style="list-style-type: none"> • Vehicle Routing (VRP) • Car Rental Pricing & Fleet Placement • Last-Mile Delivery Optimization 	<ul style="list-style-type: none"> • Crew Pairing & Rostering • Train Driver Daily Scheduling • Ground Staff Shift Scheduling 	<ul style="list-style-type: none"> • Driver Incentive Optimization • Smart Parking Route Optimization
Case Studies	SNCF (French Railways) / Uber Elevate / Copenhagen Airport	Sixt Portugal (LTPLabs) / Delhivery	Rosterize (crew scheduling ISV) / Deswik / Swissport / Geneva Airport	Lyft / EasyPark

Sports, Scheduling & Public Sector

The same mathematics that schedules the NFL also saves lives — optimization knows no boundaries

Problem Type	Sports League Scheduling	Scheduling Automation	Humanitarian & Public Health	Government & Public Planning
Description	Building fair, profitable schedules within complex constraint systems	From staff rosters to camp programs — manual scheduling automated in minutes	Allocating limited resources to save lives and respond to crises	Optimizing public sector decisions across infrastructure, education, and defense
Application	<ul style="list-style-type: none"> Season Schedule Optimization Stadium Resource Scheduling 	<ul style="list-style-type: none"> SME Workforce Roster Optimization Camp & Activity Scheduling 	<ul style="list-style-type: none"> Disaster Relief Pre-positioning Public Health Resource Allocation 	<ul style="list-style-type: none"> School District Planning Military Logistics Optimization Public Resource Allocation & Planning
Case Studies	NFL (American Football) / Beko BBL (German Basketball)	Complevo / Campify	ESUPS (disaster relief NGO) / Chilean Gov. / PATH (global health NGO)	Water Resources SE / Portland Schools / Dstl (UK gov. agency) / FCC (US telecom regulator)

What 100+ Cases Taught Us

1

Optimization adoption starts from pain, not inspiration

Across 100+ case studies, a consistent pattern emerges: adoption was driven by pain, not curiosity.

The trigger was not "we should try optimization"
— it was **"we can no longer continue this way."**

2

Speed improvement is a strategic capability shift, not just efficiency

100× faster ≠ 100× efficient.

The range of possible decisions expands.

KLM: 1 → 20–30 scenarios/week

= a different kind of strategic planning altogether

3

Every industry has optimization problems — they just haven't found them yet

Energy, supply chain, manufacturing, finance, chemicals & petroleum, public sector, etc.

— common thread: "decision-making under constraints."

4

Solver choice determines business outcomes

190×–5,000× speed difference, a binary question:
real-time ops possible or not,
strategic exploration possible or not

Fonterra: other solvers found no solution

→ **only Gurobi produced an optimal answer**



Thank You

For more information, visit [gurobi.com](https://www.gurobi.com)