PCU
Corporation
Cost Engineering Specialists

Estimating & *Construction*

PCU System

MANAGEMENT PLATFORM

PCUSystem is a **cloud-based cost management package built to accelerate estimating and construction management processes.** With databases for each industry and regional pricing across North & South America, PCUSystem dramatically reduces the effort needed to assemble, analyze, and review project costs during engineering and construction.

PCU Corporation is a software and services company:

Collaborative development of methodologies and techniques to perform accurate cost assessment and reduce the overhead in cost monitoring.

Implement these methodologies in software to share these practices with the engineering community

Standardizing estimating and cost control practices to facilitate infrastructure and resource development globally.

Providing the tools to cost control professionals to focus on proactive corrective measures rather than matching and aligning data with budgets.

PCU **Corporation**
Cost Engineering Specialists

Contents:

We believe ***software*** is not
only a tool to help us work faster, it is
the best way to share techniques and best practices with others.

Who We Are

For over 30 years, ***the PCU team have been innovation leaders at the interface of construction management and software.*** Over time we have collaborated with corporations, universities, and governments, developed and sold commercial software products, and provided countless custom software solutions fitting exact business needs.

1984

First version of PCU *(LOTUS-BASIC hybrid)*

The first version of PCU software **was created by founder and lead estimator *Guadalupe Ugarte*** to estimate and manage the construction costs of Cuzco International Airport in Peru.

1986

First commercial version of PCU sold *(database development begins)*

Guadalupe and her developers **created and sold PCU along with databases of unit cost**, for infrastructure estimates such as buildings, roads, power generation, ports, and municipal services could be completed faster.

1988

PCU software donated to universities & colleges *(inclusion in engineering & accounting curricula)*

PCU was donated to several universities throughout Peru to teach students about take-offs, construction management, and estimating processes.

1989

PCU wins 1st place for: *"The most innovative product"*

PCU receives award and cash prize **by Indecopi copyright registry.**

PCU Corporation
Cost Engineering Specialists

1990
1992

PCU develops warehousing, inventory, *and accounting software for private companies*

The master database was expanded to incorporate the resources and activities needed for niche sectors such as mining, water treatment, and railways.

1997

PCUWIN released with new interface *and MS Office, Project, and more integrations*

The software was rebuilt under the name PCUWIN and later, PCUWIN2000, with a **new user interface and integrations** with Microsoft Office applications and Microsoft Project scheduling software.

2000

PCUW2000 project evaluation software released *and sold to over 600 governmental & private companies*

2002

PCUWPERF advanced budgeting software released, *including economic analysis, pre-feasibility and feasibility studies*

2004

SIGA Executive Management System software *designed and implemented for the Ministry of Transportation in Peru* ***(still in use in 2017)***

2006
2016

PCU founder relocates to Canada and *collaborates with numerous government, corporate and consulting organizations in North America.*

PCU founder Guadalupe Ugarte **works with engineering & construction firms**, Graham, AECOM, Fluor, EllisDon, Tetra Tech, WorleyParsons, and others

2016

Development begins on new estimating *web application modeled on PCUW2000*

2017

Roll-out of PCUSystem begins, with database *web application modeled on PCUW2000 development for various industries and regions ongoing, in both Spanish and English.*

Mission

PCU Corp. is dedicated to **understanding our clients needs, and adapting our standard processes and techniques for cost estimation** and performance evaluation of construction and engineering projects, based on an engineering approach.

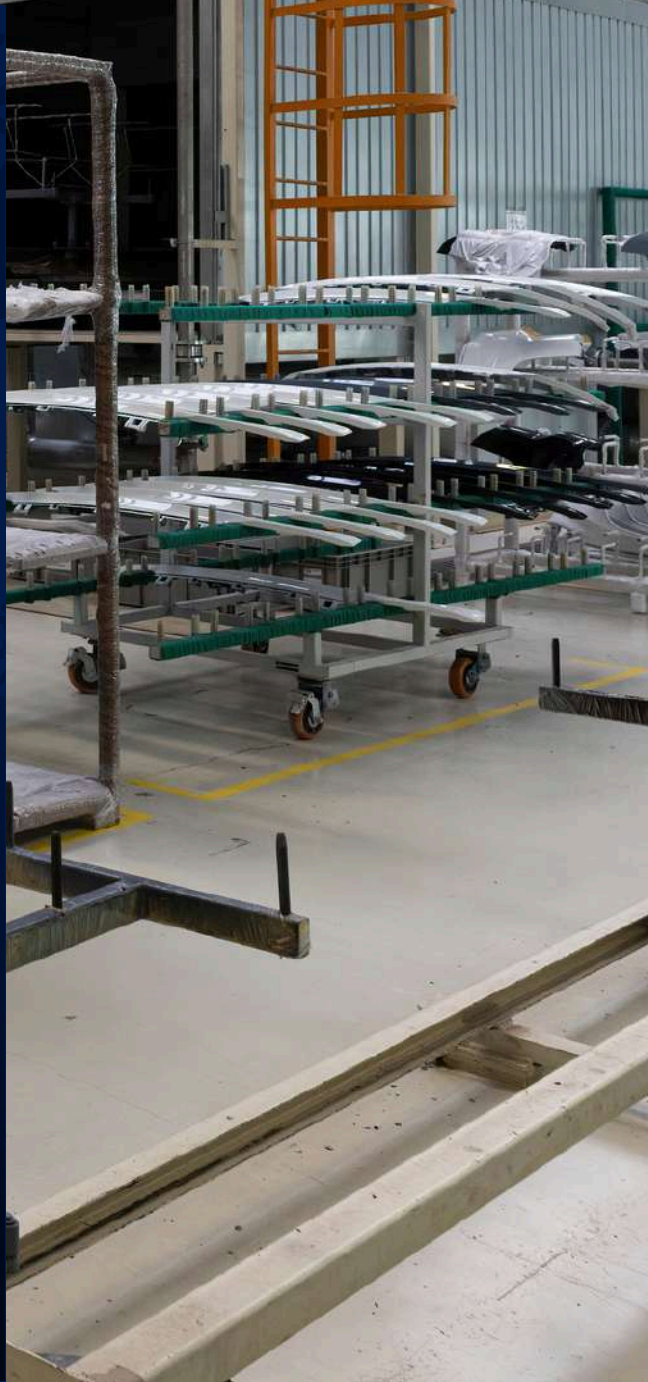
As experts in unit cost analysis, earned value, change management, and escalation, **we focus on clarity and intuitiveness** when designing reports and dashboards.

PCU Corp. **believes in teaching the basic principles of cost management through PCU System** software and standardizing construction cost management processes for projects across all major industries.

PCU Corporation
Cost Engineering Specialists

Vision

The PCU vision is to ***evolve the practice of estimating and cost control into a professional discipline*** with strict standards and high ethical integrity.



This is our

Methodology

Cost estimation for small and simple projects can be done by anyone with the relevant construction experience.

However, with larger projects, complexity increases exponentially with scale, and ***to estimate costs accurately you need to manage hundreds or even thousands of variables.*** Dealing with uncertainty in early-stage projects and managing cost escalation, risk, logistics, scheduling, and all sorts of design trade-offs can turn the estimating process into a massive undertaking.

Estimating becomes an exercise in creating and linking mathematical models that reflect the construction process, the execution strategy and the financial context of the project.

As engineers and construction professionals, ***PCU focuses on capturing the costs of design and construction processes with the greatest accuracy and in as much detail as possible.***

We have strived ***to build systems that encompass all commonly used estimation methods and all type of execution strategies,*** continuously improving according to our own experiences, as well as the feedback of our clients.

PCU Corporation
Cost Engineering Specialists

With
PCU System we now have a platform to share our methodologies with our clients and serve more governments, corporations, investors, as well as engineering specialists.

AACE International has defined a system to define the estimation levels (Classes) based on the precision we assign. The achievable accuracy for any estimate depends mainly on the level of engineering.

**If the project requires a specific level of accuracy we are able to quickly indicate whether its achievement is possible or more information is required.*

Estimate Class	***Name***	***Purpose***	***Project Definition Level***	***Accuracy***
Class 5	Scoping (Order of magnitude)	Screening	0% to 2%	+/- 50%
Class 4	Pre-feasibility	Concept study or feasibility	1% to 15%	+/- 30%
Class 3	Feasibility (Preliminary)	Budget, authorization, or control	10% to 40%	+/- 20%
Class 2	Detailed (Substantive)	Control or bid/tender	30% to 70%	+/- 10% - 15%
Class 1	Definitive	Check estimate or bid/tender	50% to 100%	+/- 5% - 10%

+ *Our* Experience:

More than 180 Projects located in more than
15 different countries, different specialties
and levels of complexity.

& Mining, Mineral Processing
Remote Site Infrastructure

Class 1

Ministry of Energy and Mines, Open Pit Mines, Unit Cost Analysis-Construction DB, CAPEX
> ***Country, Peru (2001)***

Imperial Metals, Red Chris Copper/Gold Mine & Process Facilities, CAPEX
> ***US$46M of $545M,North BC, Canada (2013)***

Class 2

Project Mighty DD Detail Engineering Study, CAPEX
> ***CAD $ 800M, Canada (2022)***

Prodigy Gold, Due Diligence Open Pit Magino Mine, CAPEX-SUSEX
> ***US$798M, Dubreuilville, Canada (2022)***

Emmerson PLC, Khemisset PotashProject, CAPEX
> ***in progress,Northern Morocco (2023)***

Orion Resources, Project Horse II, Due Diligence, CAPEX & OPEX
> ***USD$750M, Palmas, Brazil (2023-2024)***

Orion Resources, Project Birds, Due Diligence, CAPEX & OPEX
> ***$120M$, South America (2024)***

Orion Resources, Project Birds, Due Diligence,CAPEX & OPEX
> ***$120M$, South America (2024)***

Orion Resources, Project Quartz, Due Diligence, CAPEX & OPEX
> ***$870M, Africa (2024)***

Orion Resources, Project Feather, Due Diligence, CAPEX & OPEX
> ***in progress, Central America (2024)***

Class 3

NML, Red Chris FS, CAPEX, Piping, Electrical, Instrumentation and Communications
> ***$1.6B, North BC (2023)***

Orion Resources, Project Horse, Due Diligence, CAPEX & OPEX
> ***$753M Palmas, Brazil (2023-2024)***

Orion Resources, Project Piper, Due Diligence, CAPEX
> ***$210M, Sarajevo, Bosnia& Herzegovina (2023-2024)***

CNGR AZUR Mine Lithium FS- CAPEX&OPEX
> ***$1.3B, Northern Morocco (2024)***

Fresnillo Los Peñoles, Orysivo UG Mine, PFS-B Mining, CAPEX & OPEX & Financial Analysis
> ***in progress, Chihuahua, Mexico (2024-2025)***

Denison Mine, Uranium Project FS, CAPEX
> ***in progress, SK, Canada (2024)***

Class 4

19 projects in 10 countries for a total of approximately:
> ***US$ 17,200 M (2023)***

CNGR, AZUR Mine Lithium PFS- CAPEX&OPEX
> ***US$1.4B & US$1B, Northern Morocco (2023)***

Fresnillo Los Peñoles, Orysivo UG Mine, PFS-A,Class 4 CAPEX & OPEX & FinancialAnalysis
> ***US$1.5B&$41M, Chihuahua, Mexico (2023-2024)***

Kinross, Great Bear Mine, PFS CAPEX-OPEX
> ***$1.2B, Northern Ontario,Canada (2023-2024)***

EVR, Project EVO Water Pipelines PFS, CAPEX
> ***$165M, BC, Canada (2024)***

Trafigura, Project Vanderbilt, Due Diligence, CAPEX&OPEX
> ***US$ 5.5B, Africa (2024)***

Class 5

2 projects in 2 countries for a total of approximately:
> ***US$ 1,700 US M (2023)***

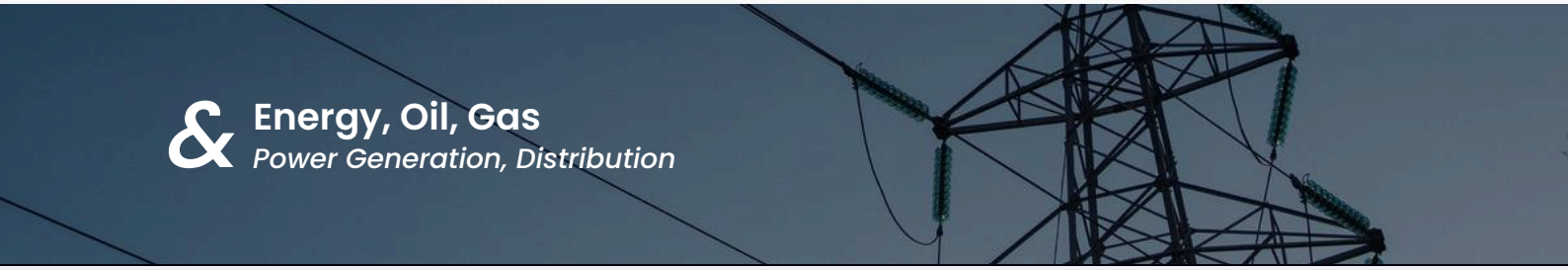
Trafigura, Project Vanderbilt, Due Diligence, CAPEX&OPEX
> ***US$ 5.5B, Africa (2024)***

Ivanhoe Electric VRB US Plant, CAPEX
> ***§ $310M, Texas, USA (2024)***

CMSA, FeNi Minishots NickelPlant, OoM, CAPEX &OPEX & Financial Analysis
> ***§Cerra Matoso, Colombia (2023)***

Others
Works

47 projects in 10 countries for a total of approximately:
> ***US$ 15,600 M***



& Energy, Oil, Gas

Power Generation, Distribution

Class 1

CEL, El Chaparral Hydroelectric Project, Estimate for Construction
> ***US$310M, El Salvador (2021)***

Surespan Power, 138 kV Transmission Lines, AB CAPEX Proposal
> ***CAD$16.3M, Medicine Hat, SK Canada***

Surespan Power, SaskPower Transmission Lines 9, SK, CAPEX Proposal
> ***CAD$16.1M, SK Canada***

Ellisdon, BBE, Keeyask Hydro Generation Project, CAPEX, Cost Control, Escalation, & Value Engineering
> ***CAD$1.6B, Thompson, MN Canada***

Class 2

BASF Corporation, BASF Lake Creek Ranch Infrastructure Upgrades CAPEX
> ***in Progress, Freeport, TX, US (2022)***

Suncor – Nanaimo Dock Upgrade, CAPEX
> ***CAD$ 0.5M, Nanaimo, BC, Canada (2021)***

BASF Corporation, P66 Terminal Upgrades, FS, options
> ***US$18.7M, Freeport, TX, USA (2023)***

FortisBC, Gas Pipeline Replacement, CAPEX Peer Review
> ***CAD$5M, BC, Canada (2024)***

Class 3

6 projects in 3 countries for a total of approximately:
> ***US$ 860 M (2023)***

Western LNG - FEED LISIMS, IPMT FS, CAPEX Peer Review
> ***US$2.8B, North BC, Canada (2023-2024)***

Class 4

10 projects in 4 countries for a total of approximately:
> ***US$ 8,300 M (2023)***

NREL, LNG Hot NitrateTank - CAPEX
> ***US$25M, Phoenix, AZ, US (2023)***

NREL, LNG Stainless-Steel Tank - CAPEX
> ***US$262.5K, Phoenix, AZ, US (2023)***

ALL LNG, Sabine Pass LNG Pre-FEED Study, CAPEX
> ***US$1.06B, Houston TX, USA (2024)***

Class 5

3 projects in 1 country for a total of approximately:
> ***US$ 12,600 M (2023)***

State Oil Company of Canada, LNG Gas Pipelineand Export Terminal, Order of Magnitude, CAPEX
> ***US$ 31B, South Asia (2023)***

Promigas – SPEC -LNG Import Terminal Expansion, OoM, CAPEX
> ***US$ 750M, Cartagena, Colombia (2023)***

Brookfield, Seropetica LiquidCO2 Plant – Due Diligence
> ***US$14M, Bahia, Brazil (2023)***

Brookfield, Nova IguacuBiomethane Plant – Due Diligence
> ***US$39M, Bahia, Brazil (2023)***

AVA LNG, Order of Magnitude Study, CAPEX
> ***US$295, South Lina, Peru (2024)***

Argent LNG, Order of Magnitude Study, CAPEX
> ***US$17.9B, Port Fourchon, Louisiana, USA (2024)***

ALL LNG, LNG Truck Loading, CAPEX
> ***US$165M, Dallas TX, USA (2024)***

TotalEnergies - RNG Standardization OoM, CAPEX, Various
> ***5 Europe Countries and 5 cities of United States (2023 – 2024)***

ALL LNG, LNG Bunkering Facility,CAPEX
> ***US$190M, Houston TX, USA (2024)***

Others
Works

7 projects in 4 countries for a total of approximately:
> ***US$ 3,800 M***

Transportation (Road, Bridge, Rail,
Seaport, Airport, and Mass Transit) Infrastructure

Class 1

Crosslinx, Eglinton LRT, Main and Secondary Stations, Peer Review Class 1 Estimates of Change Orders
> ***In Progress, Toronto, Canada (2022)***

Surespan Construction, Meadow Creek Bridge Replacement, CAPEX Proposal
> ***CAD$8M, AB Canada***

Surespan Construction, Alexandra Rehabilitation Bridge, CAPEX Proposal
> ***CAD$16M, BC Canada***

Ellisdon, Metrolinx, ECLRT Design-Build Project, CAPEX
> ***CAD$6.5B, Toronto, Canada***

Class 2

Stepan – Gemini Rail Project FEL3, CAPEX
> ***US$3M, Pasadena, TX, US (2021)***

RTI Marine Port Berth Expansion for Coal, Oil and gas, CAPEX for construction

> ***In Progress, Prince Rupert, North BC, Canada (2020)***

Nexen INC, Access Road to Digby Island, CAPEX

> ***CAD$4M, Prince Rupert, North BC Canada***

Pacific Northwest LNG, Technip Access Road & Bridge, Estimate

> ***CAD$41.6M, North BC, Canada***

Woodfibre, Darrell Bay Port Facilities, Detail Engineering, CAPEX

> ***CAD $ 5.9M, Squamish BC, CA (2023)***

Class 3

3 projects in 1 country for a total of approximately:

> ***US$ 1,800 M (2023)***

Class 4

8 projects in 2 countries for a total of approximately:

> ***US$ 2,400 M (2023)***

BC Ferries,Tsawwassen, PFS, CAPEX

> ***CAD$ 40M, Vancouver, BC, CA (2023)***

Class 5

6 projects in 2 countries for a total of approximately:

> ***US$ 120 M (2023)***

BCR Properties Vancovuer Wharves Demolition & Rehabilitation Study, CAPEX

> ***§CAD$42M, Vancouver, BC, Canada (2024)***

Others
Works

12 projects in 4 countries for a total of approximately:

> ***US$ 19,800 M***

& Water
Waste Management Infrastructure

Class 4

Pembina, Water Intake Facility, CAPEX
> ***CAD $ 2.7M, Edmonton, AB, CA (2022)***

AES Petersburg Storm Water Outfall, CAPEX
> ***CAD $ 2.7M, Indiana USA (2022)***

Teck - Greenhills Creek, Water TreatmentPlant, CAPEX
> ***in Progress, Elko BC, Canada (2023-2024)***

Rio Tinto Kennecott Mine Depressurization Wells, CAPEX
> ***US$11M, Utah, USA (2024)***

AIHA- DIZ intake, Water Reservoir, CAPEX
> ***US$64M, Lamount County,AB, Canada (2023)***

Class 5

SFWPA – Water Reservoir CAPEX
> ***In Progress, California, US (2022)***

Woodfibre Darrell Bay Port Facilities, CAPEX
> ***CAD $ 5.9M, Squamish BC, CA (2022)***

NEOM, Desalination &ZLD-HL, Order of Magnitude, CAPEX 7 options
> ***US$1.3B to $7.8B, Duba, Saudi Arabia (2023)***

Others
Works

Inter Pipelines, North Saskatchewan River Outfall
> ***US$0.26M, Edmonton, AB, CA (2022)***

Discovery Bay City, Diffuser Outfall Repairs
> ***CAD$0.26M, San Francisco, CA, US (2022)***

MMG, IZOK Corridor Project Feasibility Study, Water Management
> ***CAD$555M of $2.95B, NWT, Canada***

14 projects in 4 countries for a total of approximately:
> ***US$ 4,900 M***

Municipal
Infrastructure

Others
Works

University of Regina, Student Housing Servicing Project (13 Ha)
- ***$1.3M, Regina, Saskatchewan, Canada***

City of Regina, Intermodal Facility and Industrial Park Servicing Project (1,400 ha), Regina, Saskatchewan – Project civil engineer for conceptual plan and pre-design of a water system for a 1,400 ha industrial park.
- ***Cost estimate and Final report, $88M***

City of Jesus Maria, Restoration and Paving of Main Square "Diez Canseco", Lima, Peru – Engineering study project manager for project design, topographic survey, soil testing, quantities take off, cost estimate, specifications, schedule and cash flow
- ***A total of 8 projects have been developed in 2 countries: Canada and Peru***

PCU Corporation offers comprehensive ***estimating services*** for clients and projects of all sizes in every major industry involved in ***natural resources, energy, and infrastructure.***

Our integrated approach to estimating and cost control ***reduces project risk through more accurate results and smoother transitions*** from the beginning stages of project planning through to execution.

Our core services include:

01 ***Capital cost*** estimates

02 ***Operating cost*** estimates

03 ***Financial*** models

04 ***Cost*** control

05 ***Cost databases for*** projects in all stages of development

Services

PCU Corporation
Cost Engineering Specialists

We follow the ***standards established*** by:

AACEI

Association for the Advancement
of Cost Engineering International

In addition to complete estimates and economic models,
We perform **specialty services** related to project cost analysis, including:

01 ***Peer*** Reviews

02 ***Due Diligence*** Reviews

03 ***Escalation of*** cost estimates

04 ***Risk & Sensitivity*** analysis

05 ***Dashboards &*** Reporting

Core Services

PCU has strived to develop our processes and systems to ***encompass all estimating methodologies***, capture all types of contracting strategies, and continuously refine our models as we serve more industries.

Once we have confirmed the basic project data such as location, estimate classification, and execution model, ***our systematic estimating process follows a standard sequence to capture the complete scope of any project...***

0.1 *Develop a Work Breakdown Structure (WBS)*

- Which subdivides the scope of work by physical location, work area, contract, and/or other logical system, and Code of Accounts (CoA).
- Which subdivides the work by discipline, commodity, or type of work, typically aligned with corporate internal accounting systems.
- Determine if the project is divided into phases and if multiple scenarios will be estimated.

Quantity Take-Off 0.2

Based on the level of engineering definition, the scope of work within each WBS area is quantified using standard units of measure in order to calculate costs and provide a basis for measuring construction progress.

0.3 *Unit cost Analysis*

- It is the process of defining how each quantity will be completed.
- It is an analysis of the activities and resources required and is developed according to the construction methodologies to be used.

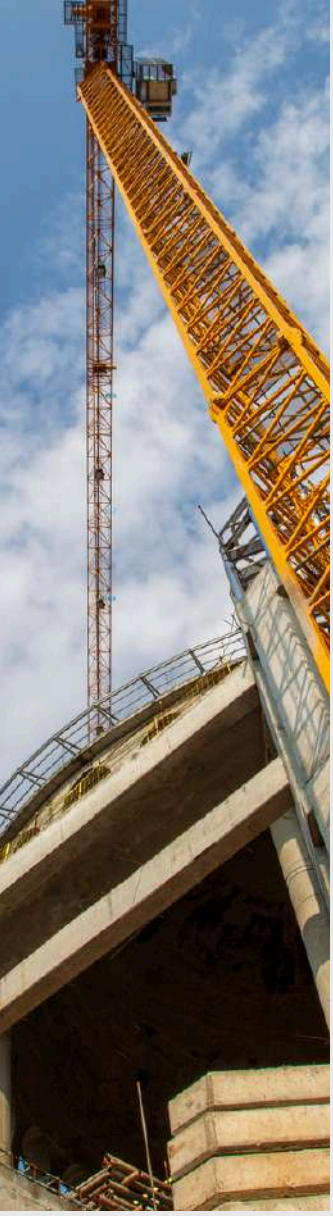
Compile the Estimate & Apply Productivity Factors 0.4

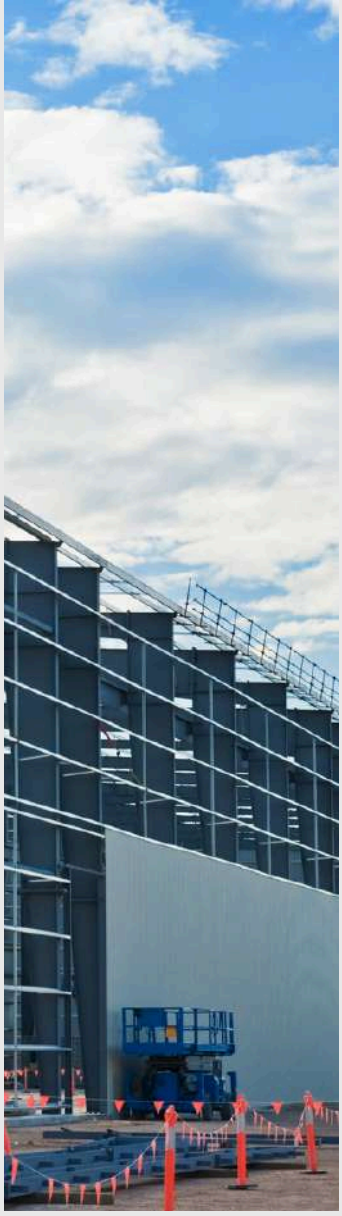
We take into account project location and site conditions, and a contractor markup based on an analysis of overhead costs.

0.5 *Analyse all Variable & Fixed Indirect Costs*

Including temporary facilities and services, engineering, owner's costs, and provisions such as contingency.

- As part of this process, we validate the project schedule by aligning the estimate productivity and resource data with the schedule activities and target dates.





Throughout the estimating process, ***we continuously look for opportunities for value engineering*** to ensure the total cost reflects a realistic and optimized project design and execution.

Our reporting tools help with evaluating complex trade-offs related to both technical design alternatives and construction considerations.

Completed cost estimates are stored as an organized database, so that all details can be efficiently transferred into any accounting or project control system to serve as the baseline budget for project execution. ***PCU can set up change management, earned value management, escalation, and progress reporting systems*** that retain the full resource-level cost detail from the original estimate, ensuring that deviations from the baseline are detected as quickly as possible.

PCU also develops integrated ***cash flow models based on forecasts of capital and operating expenditures, revenues, and financial analysis.*** Our economic models are directly linked to our estimates and grant the user control of all variables for comparative evaluation of multiple economic and project scenarios.

Finally, ***PCU provides guidance and frameworks for development of estimating databases,*** helping clients store and structure their data for future reference based on an understanding of their goals and processes. We also perform repair, reorganization, summarization, recoding, analysis, and reformatting of existing data.

Specialty Services

Peer Review

A peer review or fatal flaw study is a critical review of a complete estimate or model based on our methodology. ***It is intended to identify any significant flaws or issues with the estimate,*** but does not include verification of the stated accuracy.

The structure of the estimate is reviewed for comprehensiveness based on the scope of the project, and each WBS area is checked for errors or omissions. Labour/crew rates, prices of key items, and unit rates for major construction activities are reviewed to ensure that they are within the expected range. Indirect costs and contingency values are verified as appropriate for the project.

Due Diligence Review

A due diligence review is a ***comprehensive review of an estimate based on our methodology.*** It is intended to fully validate an estimate or model and verify the stated accuracy.

Every cost used in the estimate is checked through a combination of reference data from similar projects and contractors, cost benchmarking, execution and logistics plan reviews, and evaluation of economic conditions. ***A due diligence review report documents all findings and provides recommendations for further project development,*** including a summary of risks and opportunities related to the cost of the project.

The review generally consists
of the following parts:

First *Part*	***Review of estimate structure*** for consistency and completeness, WBS (area) coding, commodity and discipline codes, resource and labour crew codes, etc.
Second *Part*	***Analysis of installation labour and crew rates,*** including all elements of rate build-ups (taxes, burdens, allowances, indirect costs), productivity, work hours and work schedule, and equipment rates (factored from labour costs, hourly equipment rate per crew, or itemized equipment unit costs for each activity).
Third *Part*	***Review of quantities and pricing methods per each engineering design discipline.*** Verify quantities against drawings, MTOs, equipment lists, and pricing against proposals/quotations. Benchmark unit rates for all major construction activities.
Fourth *Part*	***Analysis of indirect and owner's costs*** given the project execution/contracting strategy, and site conditions.
Fifth *Part*	***Operating cost review*** for scope, basis of prices, and alignment with operating plan and design criteria.
Sixth *Part*	***Verification of capital and operating cash flows*** used in the financial analysis for alignment with CAPEX and OPEX. Review of sustaining CAPEX scope and basis of pricing.
Final *Part*	***Summary of findings, conclusions, risks/opportunities, and recommendations.***

Escalation
Process

It is the process of adjusting and estimate to account for changes in pricing and costs over time. By organizing an estimate into commodity groups, ***We can forecast final costs for a project that is planned to be executed in the future*** (forward escalation).

We also update past estimates to the current date using market data and regional escalation indices that are published monthly. As part of our escalation process, we create systems and procedures to define how future escalations can be performed.

Risk
Analysis

We perform industry standard simulation (Monte-Carlo) based risk analysis in co-ordination with engineers at every stage and level of estimate. The quantitative approach guides the sizing of the project contingency reserve based on a specific level of confidence.

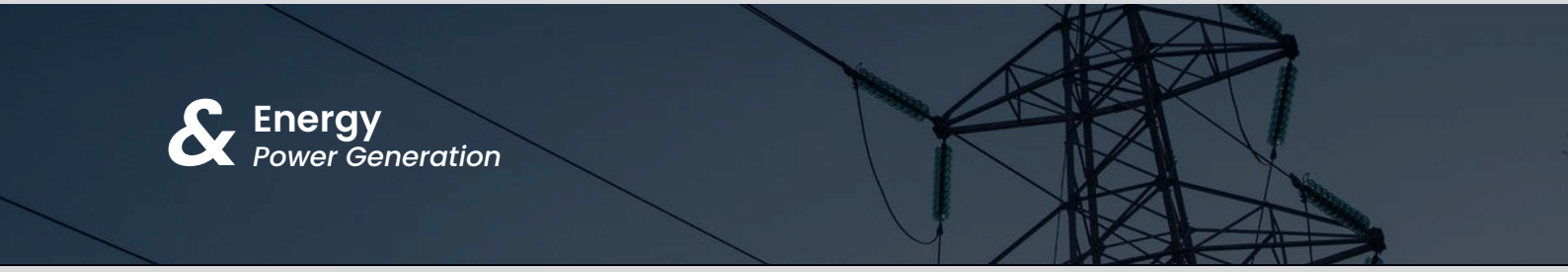
Dashboards
& Reporting

Using an organized database structure enables us to ***connect engineering, cost, procurement, scheduling and economic data into one model*** and create dashboards and reports customized to the needs of each client. Our reports can include escalation, currency exchange, risk analysis, and other significant variables.

Our areas in the

Industries

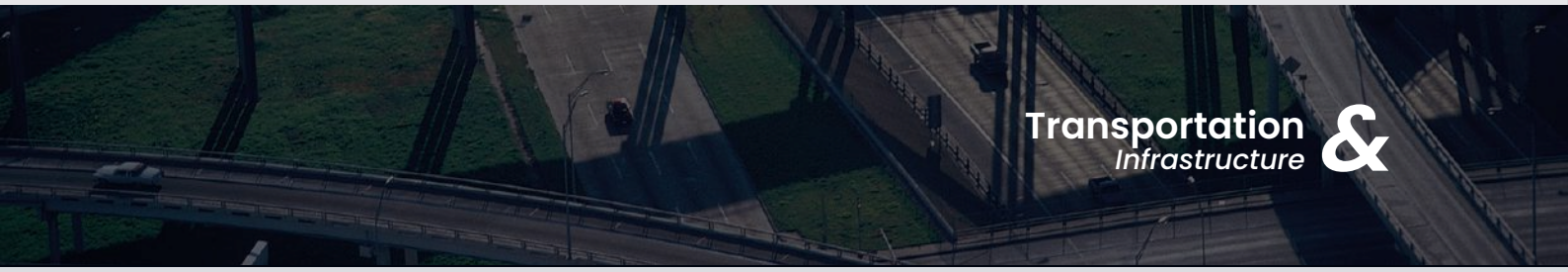
- *Surface Water Management*
- *Pipelines & Pipe Networks*
- *Water & Wastewater Treatment*
- *Tailings and Industrial Waste Management*



- *Power Transmission*
- *Hydroelectric*
- *Oil, Gas, & LNG*
- *Fuel Storage & Distribution*
- *Power Generation*

PCU is seeking strategic partnerships in nuclear and renewable power generation technology. In exchange for assistance in database development, PCU can offer estimating and cost control solutions and PCU System software licenses at reduced rates or free of charge.

***Contact us to inquire about this opportunity**



- *Roads & Highways*
- *Bridges & Tunnels*
- *Rail & Transit Systems*
- *Marine Transport Infrastructure*

- *Open Pit, Underground, and Combined Mine Development*
- *Comminution, Flotation, Solid-Liquid Separation, Physical and Chemical Extraction Processes*
- *Material Handling, Concentrate/Product Transport & Storage*
- *Remote Site Infrastructure, Fuel Storage, Power Generation, Logistics*
- *Camp and other Site Facilities*

PCUSystem's uncertainty, risk, and contingency analysis and calculations ***validates estimates against NI 43-101 and CIM standards in Canada*** *for estimate accuracy.*

Project

Map

PCU Corporation
Cost Engineering Specialists

/pcucorp.com

Contact us

307-2958 Whisper Way,
Coquitlam, BC V3E 3S7

info@pcusystem.com

(+1) 778-919-3150
(+1) 519-636-2666