

CLEAN RESOURCES FINAL REPORT PACKAGE

Project proponents are required to submit a Final Report Package, consisting of a Final Public Report and a Final Financial Report. These reports are to be provided under separate cover at the conclusion of projects for review and approval by Alberta Innovates (AI) Clean Resources Division. Proponents will use the two templates that follow to report key results and outcomes achieved during the project and financial details. The information requested in the templates should be considered the minimum necessary to meet AI reporting requirements; proponents are highly encouraged to include other information that may provide additional value, including more detailed appendices. Proponents must work with the AI Project Advisor during preparation of the Final Report Package to ensure submissions are of the highest possible quality and thus reduce the time and effort necessary to address issues that may emerge through the review and approval process.

Final Financial Report

The Final Financial Report shall provide complete and accurate accounting of all project expenditures and contributions over the life of the project pertaining to Alberta Innovates, the proponent, and any project partners. The Final Financial Report will not be publicly released.

Alberta Innovates is governed by FOIP. This means Alberta Innovates can be compelled to disclose the information received under this Application, or other information delivered to Alberta Innovates in relation to a Project, when an access request is made by anyone in the general public.

In the event an access request is received by Alberta Innovates, exceptions to disclosure within FOIP may apply. If an exception to disclosure applies, certain information may be withheld from disclosure. Applicants are encouraged to familiarize themselves with FOIP. Information regarding FOIP can be found at <http://www.servicealberta.ca/foip/>. Should you have any questions about the collection of this information, you may contact the Manager, Grants Administration Services at 780-450-5551.

CLEAN RESOURCES FINAL FINANCIAL REPORT

Please submit the Final Financial Report as a separate document from the Final Public Report as the Final Financial report will be kept confidential. The Final Financial Report consists of updating and submitting the *Work Plan, Budget and Metrics* template in pdf form and completing the sections below.

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1. PROJECT INFORMATION

| | |
|--|--|
| Project Title: | Blockchain-Based Smart Contracts in the Future Smart Grid |
| Alberta Innovates Project Number: | 222300550 (G2020000136) |
| Submission Date: | Nov. 12, 2024 |
| Total Project Cost: | \$2,464,208 (\$263,208 Cash) |
| Alberta Innovates Funding: | \$132,629 |
| AI Project Advisor: | Susan Carlisle |

2. APPLICANT INFORMATION

| | |
|---------------------------------------|--|
| Applicant (Organization): | University of Alberta |
| Address: | 116 St and 85 Avenue NW, Alberta Canada T6G 2R3 |
| Applicant Representative Name: | Julain Herst |
| Title: | Assistant Director, Agreements, Research Services Office |
| Phone Number: | 780-492-7885 |
| Email: | rsoadmin@ualberta.ca |

A. PROJECT COSTS

From the *Work Plan, Budget and Metrics* template:

- Copy and paste an image of the *Budget Performance* tab tables below. A blank example image is included for reference and should be replaced with the completed image.
- Provide a narrative as to the reasons for any variance between project budget costs and actual costs.

RESPOND BELOW

| CASH | | | | | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|
| Project Costs (Cash) - Original Budget | | | | | | | | | |
| Activity | Milestone 1 | Milestone 2 | Milestone 3 | Milestone 4 | Milestone 5 | Milestone 6 | Milestone 7 | Total Costs | Total Costs (%) |
| Infrastructure/Equipment (Capital) | \$67,365 | \$0 | \$6,000 | \$0 | \$0 | \$0 | \$0 | \$73,365 | 3% |
| Personnel (Actual Salary & Benefits) | \$17,784 | \$45,365 | \$13,788 | \$17,010 | \$56,708 | \$23,904 | \$29,574 | \$204,133 | 8% |
| Operating Materials & Supplies | \$0 | \$5,000 | \$0 | \$0 | \$2,500 | \$0 | \$1,000 | \$8,500 | 0% |
| Contractors & Key Vendors | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Travel | \$0 | \$0 | \$0 | \$0 | \$13,000 | \$0 | \$0 | \$13,000 | 1% |
| Other | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$13,000 | \$13,000 | 1% |
| SUBTOTAL (Eligible Expenses) | \$85,149 | \$50,365 | \$19,788 | \$17,010 | \$72,208 | \$23,904 | \$43,574 | \$311,998 | 12% |
| Ineligible Costs (Contingency and Others) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| TOTAL | \$170,298 | \$100,730 | \$39,576 | \$34,020 | \$144,416 | \$47,808 | \$87,148 | \$311,998 | 12% |

| Project Costs (Cash) - Actuals and Forecast | | | | | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|----------------------|----------------------|-------------|-----------------|
| Activity | Milestone 1 | Milestone 2 | Milestone 3 | Milestone 4 | Milestone 5 | Milestone 6 | Milestone 7 | Total Costs | Total Costs (%) |
| | Actual | Actual | Forecast | Forecast | Forecast | [Actual or Forecast] | [Actual or Forecast] | | |
| Infrastructure/Equipment (Capital) | \$0 | \$7,725 | \$0 | \$0 | \$0 | \$2,179 | \$49,365 | \$59,269 | 2% |
| Personnel (Actual Salary & Benefits) | \$9,760 | \$20,405 | \$38,261 | \$27,231 | \$0 | \$43,244 | \$63,983 | \$202,884 | 8% |
| Operating Materials & Supplies | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Contractors & Key Vendors | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Travel | \$0 | \$524 | \$0 | \$0 | \$0 | \$0 | \$0 | \$524 | 0% |
| Other | \$0 | \$0 | \$531 | \$0 | \$0 | \$0 | \$0 | \$531 | 0% |
| SUBTOTAL (Eligible Expenses) | \$9,760 | \$28,654 | \$38,792 | \$27,231 | \$0 | \$45,423 | \$113,348 | \$263,208 | 10% |
| Ineligible Costs (Contingency and Others) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| TOTAL | \$9,760 | \$28,654 | \$38,792 | \$27,231 | \$0 | \$45,423 | \$113,348 | \$263,208 | 10% |

| Project Costs (Cash) - Variance (Actuals & Forecast - Budget) | | | | | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------|--------------------|
| Activity | Milestone 1 | Milestone 2 | Milestone 3 | Milestone 4 | Milestone 5 | Milestone 6 | Milestone 7 | Total Variance | Total Variance (%) |
| Infrastructure/Equipment (Capital) | -\$67,365 | \$7,725 | -\$6,000 | \$0 | \$0 | \$2,179 | \$49,365 | -\$14,096 | -19% |
| Personnel (Actual Salary & Benefits) | -\$8,024 | -\$24,960 | \$24,473 | \$10,221 | -\$56,708 | \$19,340 | \$34,409 | -\$1,249 | -1% |
| Operating Materials & Supplies | \$0 | -\$5,000 | \$0 | \$0 | -\$2,500 | \$0 | -\$1,000 | -\$8,500 | -100% |
| Contractors & Key Vendors | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Travel | \$0 | \$524 | \$0 | \$0 | -\$13,000 | \$0 | \$0 | -\$12,476 | -96% |
| Other | \$0 | \$0 | \$531 | \$0 | \$0 | \$0 | -\$13,000 | -\$12,469 | -96% |
| SUBTOTAL (Eligible Expenses) | -\$75,389 | -\$21,711 | \$19,004 | \$10,221 | -\$72,208 | \$21,519 | \$69,774 | -\$48,790 | -16% |
| Ineligible Costs (Contingency and Others) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| TOTAL | -\$75,389 | -\$21,711 | \$19,004 | \$10,221 | -\$72,208 | \$21,519 | \$69,774 | -\$48,790 | -16% |

| IN-KIND | | | | | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|
| Project Costs (In-kind) - Original Budget | | | | | | | | | |
| Activity | Milestone 1 | Milestone 2 | Milestone 3 | Milestone 4 | Milestone 5 | Milestone 6 | Milestone 7 | Total Costs | Total Costs (%) |
| Infrastructure/Equipment (Capital) | \$2,201,000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,201,000 | 88% |
| Personnel (Actual Salary & Benefits) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Operating Materials & Supplies | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Contractors & Key Vendors | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Travel | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Other | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| SUBTOTAL (Eligible Expenses) | \$2,201,000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,201,000 | 88% |
| Ineligible Costs (Contingency and Others) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| TOTAL | \$2,201,000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,201,000 | 88% |

| Project Costs (In-kind) - Actuals and Forecast | | | | | | | | | |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|
| Activity | Milestone 1 | Milestone 2 | Milestone 3 | Milestone 4 | Milestone 5 | Milestone 6 | Milestone 7 | Total Costs | Total Costs (%) |
| | Actual | Actual | Actual | Actual | Actual | Actual | Actual | | |
| Infrastructure/Equipment (Capital) | \$2,201,000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,201,000 | 89% |
| Personnel (Actual Salary & Benefits) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Operating Materials & Supplies | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Contractors & Key Vendors | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Travel | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Other | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| SUBTOTAL (Eligible Expenses) | \$2,201,000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,201,000 | 89% |
| Ineligible Costs (Contingency and Others) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| TOTAL | \$2,201,000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,201,000 | 89% |

| Project Costs (In-kind) - Variance (Actuals & Forecast - Budget) | | | | | | | | | |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------|--------------------|
| Activity | Milestone 1 | Milestone 2 | Milestone 3 | Milestone 4 | Milestone 5 | Milestone 6 | Milestone 7 | Total Variance | Total Variance (%) |
| Infrastructure/Equipment (Capital) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Personnel (Actual Salary & Benefits) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Operating Materials & Supplies | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Contractors & Key Vendors | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Travel | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Other | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| SUBTOTAL (Eligible Expenses) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| Ineligible Costs (Contingency and Others) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |
| TOTAL | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0% |

Table 1: Project Costs Summary Tables

Reasons for Variances in Table 1

There are two principal reasons for the variances reported in Table 1. Firstly, our salary cost structure was heavily impacted by recruiting difficulties during the COVID pandemic, leading to a refocusing of our original objectives (see Final Report) and re-allocation of salary expenses between milestones. This was exacerbated by having one of our PDFs (Dr. Sara Rouhani) leave early when she was offered a tenure-track Assistant Professor position after working with us for only six months. Fortunately, Dr. Rouhani was willing to continue working with us in the role of a self-funded collaborator for the balance of the project (and was indeed instrumental to its success). However, these factors meant that our total spend on salary costs came in well below our projections, even though all of our objectives were completed.

The second major variance involved shifting our acquisition of a GPU compute cluster from its planned timeframe in Milestone 1 to Milestone 7 (where it was actually used), along with being cheaper than forecast. This was the change from a \$67,365 line item in Milestone 1 to a \$49,365 line item in Milestone 7.

B. CONTRIBUTING PARTNERS

From the *Work Plan, Budget and Metrics* template:

- Copy and paste an image of the **Contributing Partners** tables from the *Final Contributing Partners* below. A blank example image is included for reference and should be replaced with the completed image.
- Provide a narrative as to the reasons for any variance between project's initial contributions and the final contribution.

RESPOND BELOW

| Project Contributions - Budget | | | | | |
|-----------------------------------|------------------|--------------------|------------|-------------|--------------------|
| Name | Cash | In-kind | Cash (%) | In-kind (%) | Total Contribution |
| Alberta Innovates Clean Resources | \$162,233 | | 6% | | \$162,233 |
| Applicant | \$0 | \$0 | 0% | 0% | \$0 |
| Government | \$32,910 | \$2,201,000 | 1% | 88% | \$2,233,910 |
| Industry | \$16,455 | \$0 | 1% | 0% | \$16,455 |
| Academic | \$100,400 | \$0 | 4% | 0% | \$100,400 |
| Not-for-Profit | \$0 | \$0 | 0% | 0% | \$0 |
| Other | \$0 | \$0 | 0% | 0% | \$0 |
| TOTAL | \$311,998 | \$2,201,000 | 12% | 88% | \$2,512,998 |

| Project Contributions - Actuals | | | | | |
|-----------------------------------|------------------|--------------------|------------|-------------|--------------------|
| Name | Cash | In-kind | Cash (%) | In-kind (%) | Total Contribution |
| Alberta Innovates Clean Resources | \$132,629 | | 5% | | \$132,629 |
| Applicant | \$0 | \$0 | 0% | 0% | \$0 |
| Government | \$32,910 | \$2,201,000 | 1% | 89% | \$2,233,910 |
| Industry | \$16,455 | \$0 | 1% | 0% | \$16,455 |
| Academic | \$81,212 | \$0 | 3% | 0% | \$81,212 |
| Not-for-Profit | \$0 | \$0 | 0% | 0% | \$0 |
| Other | \$0 | \$0 | 0% | 0% | \$0 |
| TOTAL | \$263,206 | \$2,201,000 | 11% | 89% | \$2,464,206 |

| Project Contributions - Variance (Actuals - Budget) | | | | | |
|---|------------------|------------|------------|-------------|------------------|
| Activity | Cash | In-kind | Cash (%) | In-kind (%) | Total Variance |
| Alberta Innovates Clean Resources | -\$29,604 | | -1% | | -\$29,604 |
| Applicant | \$0 | \$0 | 0% | 0% | \$0 |
| Government | \$0 | \$0 | 0% | 2% | \$0 |
| Industry | \$0 | \$0 | 0% | 0% | \$0 |
| Academic | -\$19,188 | \$0 | -1% | 0% | -\$19,188 |
| Not-for-Profit | \$0 | \$0 | 0% | 0% | \$0 |
| Other | \$0 | \$0 | 0% | 0% | \$0 |
| TOTAL | -\$48,792 | \$0 | -2% | 2% | -\$48,792 |

Table 2 – Project Contribution Summary Tables

Reasons for Variances in Table 2

As discussed above, our total salary spend was quite a bit below our original forecast, by about \$49,000. This is the reason for the variance in project contributions for AI Clean Resources and our Academic partner (Future Energy Systems at the University of Alberta).