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|---|---|---|---|
| **Project Name:** | Novalia (Wind turbines) (LOSS) | **Start Date:** | 2017-07-24 |
| **Project Number:** | 1702 | **Completion Date:** | 2018-04-11 |

## Project Details:

## Scientific or Technological Objectives:

| Measurement | Current Performance | Objective | Has results? |
|---|---|---|---|
| Turbine power increase (%) | 100 | 240 | No |

[5] By reassessing the Appellant's tax payable for the 2011 taxation year, the Minister made the following assumptions of fact, listed in subsection 11 of the Reply to the Amended Notice of Appeal:
a) [TRANSLATION]
The Appellant works primarily in the sale and development of new mechanical concepts for manufacturers or prospective license buyers;
b) The Appellant operated under the name Les Moteurs Novalia 2000 Inc. until March 15, 2011;
c) The Appellant is a "Canadian-controlled private corporation" under the Act;
i) Normand Beaudoin filed a patent application for a "Turbine energy windmill" on August 19, 2011 (CA 2750048); however, the patent was not issued until April 24, 2013;

Minister made the following assertions of facts:

j) With respect to project no. 1, entitled "Turbine energy windmill" (project no. 1):
i) The goal was to increase turbine windmill power and make all of its components ergonomically cost-effective with the following features:
A. Less cumbersome;
B. Blade width will be equal to that of its extremities, which will increase wind surface area;
C. Blades will exert a positive force that will be evenly distributed amongst all components.
ii) The Appellant submitted secondary objectives for potential commercial applications (vacuums, propellers/pumps), without demonstrating any related activities;

vi) The Appellant did not define, from the outset, the performance indicators or measures to be carried out to meet its primary objective. These measures are a standard part of a systematic investigation process;

## Field of Science/Technology:

Applied mathematics (1.01.02)

## Project Details:

| | |
|---|---|
| Intended Results: | Improve existing processes, Improve existing materials, devices, or products |
| Work locations: | Research Facility |
| Key Employees: | Normand Beaudoin (Music - PhD (1980) / President) |
| Evidence types: | Records of resources allocated to the project, time sheets; Samples, prototypes, scrap or other artefacts; Photographs and videos |

## Scientific or Technological Advancement:

### *Uncertainty #1: Technological uncertainty*

iii) The Appellant evaluated existing wind power concepts and devised a drive engine with pulleys and rectangular blades, without taking into account any concepts related to fluid dynamics, modelling, natural phenomena or laws that could enter into play.

iv) The technology base or level for project no. 1 can be compared to that of wind turbines, which are a cross between a windmill and a turbine;

v) The Appellant indicates that it would like to increase wind turbine power in an ergonomically cost-effective manner, but does not list or describe the parameters in question;

The most significant underlying key variables are:

blade shapes & orientations (unresolved)

## Technology or Knowledge Base Level:

Benchmarking methods & sources for citings:

| Benchmark Method/Source | Measurement | Explanatory notes |
|---|---|---|
| Patent searches | 11 patents | patent granted US- 11 patents + referenced by 8 since https://www.google.com/patents/US20130202435?cl=en |

### Activity #1-1: Activity 1 (Fiscal Year 2017)

**Methods of experimentation:**

vii) The Appellant evaluated existing wind turbine concepts;

viii) The Appellant developed a mechanism (pulleys and rectangular blades, belts) to interest future investors, but failed to create models or take validation measures, natural phenomena or laws into account that could enter into play (fluid dynamics, among other things).

ix) The Appellant presented real-time calculations prepared by a third party comparing a rectangular turbine to a circular turbine; however, these were not corroborated, were based on static conditions and did not include actual dynamic parameters;

x) The calculations submitted by the Appellant (prepared by a third party with no corroboration) present a theoretical efficiency of 240% with no scientific basis or corroboration over time;

xi) The Appellant constructed a mechanism (bicycle base / blades / parallel belts / fittings with criss-cross supports) based on current engineering practices;

[18] According to the CRA professional witness (Mr. Haine, ____ Designation not disclosed)"

[19] Mr. Beaudoin did not contest Mr. Haine's status as an expert, but naturally disagreed with the conclusions of the report. In his opinion, the quality of the report cannot be relied upon because Mr. Haine refused to consider previous machines or wind turbines constructed later and, thereby, the general scientific advancement, by focusing solely on the specific technology, the scientific basis of which he called into question. Mr. Beaudoin's theory on the scientific advancement is as follows:

[TRANSLATION]
It is not the drive wheels or the belts that provide the scientific basis for the advancement; rather, it is the fact that the drive wheels increase rotation speed and that the belts play a key role similar to the effect of the connecting rod in a piston engine or a counter-rotational cylinder in a turbine engine, which free the blades from strict axis rotation, and synchronizes them with the fluid flow.:

None of the activities (experiments or analyses) demonstrated whether or not this objective was achieved. When it is a question of aerodynamics, which is the case with wind turbines, standard experimentation can only be performed in a wind tunnel (more controlled environment). If Mr. Beaudoin could only demonstrate the validity of his idea through visual effects, we would expect to see two devices (one conventional and one based on the new concept) tested under the same conditions to be able to observe the difference. In the end, we do not know what the device was used for other than to move air, as all other wind turbines do, only in a more complicated manner. Moreover, no mathematical models of the natural phenomena at play were created.

In conclusion, I am of the opinion that the goal of the work performed was not to resolve any scientific or technological uncertainty. Rather, it illustrated an idea that was based on an erroneous understanding of the phenomena that characterize wind turbine movement. Mr. Beaudoin's explanations did not help me to understand how the device he built could lead to any kind of advancement in wind turbine power or increase in the knowledge of the technology in question. Mr. Beaudoin may have had a few good ideas for the design and construction of the device itself (presented in the video); however, that is not enough to demonstrate the scientific or technological advancement he claims in his application.

[19] Mr. Beaudoin did not contest Mr. Haine's status as an expert, but naturally disagreed with the conclusions of the report.

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[20] According to Mr. Beaudoin, the advantage to synchronizing the blades with the fluid flow is that it reduces the machines' loss of efficiency because their rotational motion is unitary and too slow, making the connecting rod less effective.

**Results:**

xii) The Appellant's mechanism creates mechanical friction that reduces the efficiency rating of 240%;
xiii) The Appellant tested the mechanism (vertical and horizontal positions) and experienced issues with it that reduced the efficiency rating of 240%;
xiv) The Appellant did not purchase any materials for project no. 1, even though it indicated that it had tested the mechanism;
xv) The Appellant tests its mechanisms using a trial and error system;
xvi) The Appellant's work involved a pre-feasibility study for a potential project and did not explore beyond current practices;

**Conclusion:**

The CRA contended that the goal of the work performed was not to resolve any scientific or technological uncertainty. Rather, it illustrated an idea that was based on an erroneous understanding of the phenomena that characterize wind turbine movement.

According to the Judge:

[25] It is important to reiterate here that the Appellant's research project has been examined by three CRA scientists, one of whom is considered an expert, and that Mr. Beaudoin has had many opportunities to explain his point of view and convince them that his research activities meet the requirements of the Act.

According to the CRA's scientists, the Appellant's research project never reached the SR&ED stage because it simply involves a concept illustrated by drawings and demonstrated using an extremely rudimentary prototype, at least in the 2011 version of the project.

[26] If we apply the criteria set out by Bowman J. in Northwest Hydraulic Consultants Ltd. v. The Queen, cited above, to determine whether the Appellant's research activities qualify as SR&ED, it is clear that none of the five criteria therein are met in this case. There is a lack of both uncertainty and technological advancement; no clear hypothesis was formulated or technological investigation performed as part of the scientific method used; and, lastly, the hypotheses, tests performed and results obtained were not properly recorded as the project progressed.

[27] In conclusion, the work performed by the Appellant does NOT constitute SR&ED within the meaning of subsection 248(1) of the Act,

**Documentation:**

- Uploaded to RDBASE.NET: 2016_TCC_81 Novalia Advancement Wind Turbines LOSS.pdf (141KB)
- Offline Documents: Prototype (covered in snow), Videos of prototypes

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