

# Intellectual Energy LLC

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February 10, 2015

Mr. Jeff Porter  
Principal Scientist  
Yancy Corporation

## ***RE: Intellectual Energy LLC's Valuation of the Yancy Corporation's Patent Portfolio***

Dear Mr. Porter:

This memo is intended to document the results of the Intellectual Energy LLC ("Intellectual Energy" or "we" or "our") valuation of the Yancy Corporation's ("Yancy" or "your") patent portfolio. The scope of our valuation engagement is covered in our engagement letter to you dated October 30, 2014.

I am the Founder and Managing Director of Intellectual Energy LLC. Intellectual Energy is an intellectual property consulting company that focuses on helping clients realize value from their intellectual property assets. At Intellectual Energy and with previous organizations, I have performed complex valuation analyses of intellectual property in a variety of scenarios, including fundraising, licensing, merger & acquisition transactions and litigation. I have valued all forms of intellectual property, including patents, trademarks, copyrights, trade secrets, know how and training programs. I am trained and certified as a Certified Licensing Professional (CLP) and a Certified Patent Valuation Analyst (CPVA), and I frequently teach courses on valuation for professionals under the CLP and CPVA programs.

Our valuation of Yancy's patent portfolio is based on data, business plans, calculations, statements and representations provided by Yancy's management and third party advisors. We have validated these to the extent possible. In addition, we have conducted independent research into the market for patents owned by companies similar to Yancy and the market value of similar patents as those owned by Yancy.

The opinions expressed in this memo are based on information available to us as of the date of this writing, February 10, 2015. Valuation of any asset may change if underlying economic conditions or other material factors change subsequent to the date of the valuation. All readers of this letter should be aware of any such subsequent conditions and factors that are material to the valuation of the Yancy patent portfolio and use appropriate caution in using the valuation discussed in this memo.

### **Valuation of the Yancy Corporation Patent Portfolio**

It is my opinion that, as of February 10, 2015, the valuation of the patent portfolio in the core microscope market (the Base Case scenario) is \$20,657,803.

I also evaluated two additional scenarios where Yancy's patent portfolio achieves broader market penetration into other microscopy applications. If the patent portfolio achieves a moderate market penetration into other applications, the valuation as of February 10, 2015 is \$31,759,351. If the patent portfolio achieves a high market penetration into other applications, the valuation as of February 10, 2015 is \$50,896,719.

### **Background on the Yancy Corporation**

Yancy Corporation is an early stage technology development company incorporated in Oregon and based in Arizona. Yancy's founder and Principal Scientist is Jeff Porter. Mr. Porter is a prolific inventor and technology developer with many years of experience in high technology, including measurement and testing technologies, semiconductor manufacturing and electronics manufacturing. Mr. Porter has worked for large technology companies such as Hewlett Packard as well as for smaller entrepreneurial start-ups.

Yancy's other principals include Cheryl Watkins. Ms. Watkins is an experienced businessperson with sales, marketing, financial management and administrative experience. She works closely with potential Yancy partners and customers and manages the company's finances. Mr. Porter and Ms. Watkins have other team members with experience in product development, technology transfer and prototype manufacturing supporting their efforts. Since these individuals are still employed by other parties, I do not name them in this letter.

Yancy has informed me that their preferred business strategy is to develop their microscope technology and license it out to current and new companies in the microscope industry. They have no plans to enter into manufacturing of their own products, beyond prototypes to support the licensing efforts. All of my valuation calculations are based on a licensing business model.

### **Background on the Yancy Corporation Patent Portfolio**

Yancy Corporation's primary patent asset is US Patent Application number US 2014/0240823 A1, titled "Method and Apparatus for Producing a Super-Magnified Wide-Field Image". This application was filed on November 27, 2013 and was published on August 24, 2014. The claims of the patent application cover a method of producing a super magnified image using various constructions of wide field microscopes. The technology disclosed in the patent application provides far better resolving power than can currently be achieved with light microscopes. Yancy has demonstrated 30-nanometer resolution using a 488-nanometer light source, which is a 67% improvement on the current world record. Resolution at this fine a level is currently only available using elaborate sample preparations that usually destroy the sample of the material being imaged. The Yancy technology also does not require extensive data processing after the image is acquired, and can produce real time images. The patent pending technology uses novel concepts to break through the "Abbe Limit", a longstanding resolution constraint for optical microscopes of 200 nanometers.

The patent pending Yancy technology has been demonstrated with a "garage" scale prototype using inexpensive scavenged surplus parts. The prototype has shown that the technology does achieve world record-breaking levels of resolution without expensive custom parts, elaborate and destructive sample preparation or post imaging processing.

## **Market for Microscope Technology**

Microscope technology is widely used in a number of industries, from academic and industrial research to diagnostic testing to semiconductor manufacturing. Yancy provided me with an extensive list of potential markets that could use the patent portfolio to improve existing products or create new market opportunities for incumbent producers of microscope products.

For the Base Case valuation analysis (described in detail below), I focused on current producers of optical microscopes as the target market. German and Japanese companies dominate this market. These are companies with long histories of manufacturing high quality optical lenses for cameras. I obtained the most recent sales data for the microscope business units of Zeiss, Olympus, Nikon and Leica. There are many smaller, non-publically traded companies that also produce microscopes, but the four named companies are believed to have about a 67% market share. The four largest companies reported a total of \$2.95 B in microscope sales in 2014; this was up from 2013 but still significantly less than sales prior to the Great Recession. Applying the market share estimate, I estimate that the total microscope market for the Base Case is approximately \$4.4 B.

## **Valuation Determination**

In determining the value of Yancy's patent portfolio, I considered several methods and approaches, including the Cost Method, the Market Method and the Income (Discounted Cash Flow) Method. After study and deliberation, I chose to use a combination of the Market and Income Methods.

I determined that the valuation of the Yancy patent portfolio for the core microscope market as of February 10, 2015 is \$20,657,803. I also evaluated two additional scenarios where Yancy's patent portfolio achieved broader market penetration into other microscopy applications. If the patent portfolio achieves a moderate market penetration into other applications, the valuation as of February 10, 2015 is \$31,759,351. If the patent portfolio achieves a high market penetration into other applications, the valuation as of February 10, 2015 is \$50,896,719.

A more detailed explanation of my approach and methodology is discussed below.

## **Base Case Valuation**

The Market Method uses comparable transactions to value intellectual property. It is analogous to real estate appraisal, where appraisers use comparable previous transactions to determine the value of a current property transaction.

For the Base Case (defined as the core microscope market, comparable to the market segment identified above), I relied on market timing and market penetration rates provided by Yancy Corporation. Yancy indicated that they believed that they could begin licensing technology to this market within two years, with peak market penetration occurring seven years after that, and some market share erosion beginning nine years after first sales of the technology. The peak market penetration is expected to be about 35% of the current market size as defined above. Based on my experience, these assumptions seem to be reasonable and achievable in a licensing business with breakthrough technology and strong patent protection.

I worked with ktMine to find comparable transactions. ktMine is a database provider who, for over ten years, has found and cataloged records of intellectual property transactions from public company filings, news sources, press releases and litigation results. ktMine is considered to be one of the top providers for comparable intellectual property transactions, and I have used them many times for valuation engagements.

I requested comparable transactions for microscope and microscopy technology. ktMine returned 54 potentially relevant transactions that met my search criteria. I then examined the abstracts of these transactions and eliminated transactions that I did not feel to be comparable to the Yancy patent portfolio. This resulted in 21 transactions that I deemed to be potentially comparable. I then obtained the detailed descriptions of these 21 transactions. Upon further review, I eliminated six other transactions that were not comparable to Yancy's patent portfolio. This left a database of 15 transactions that appeared to be closely comparable to what Yancy Corporation plans to do.

The comparable transactions expressed the value of the licensed property in terms of a royalty rate, or the percentage of the licensee's revenue that is paid for the right to use the licensed property. In the database of 15 comparable transactions, the royalty rate ranged from 2 % to 12.5%, and 8 of the 15 transactions had royalty rates in excess of 5%. The average royalty rate was 4.65 %. For the Base Case valuation, I used the average royalty rate of 4.65 % for my analysis.

I then examined the appropriate revenue base for the patent portfolio. I referred to the Yancy market projection that was provided to me. This Excel model has a detailed breakdown of all of all projected revenue streams from the licensing of the patent portfolio for 10 years after the first product license is executed, which is expected to be within 2 years. These revenue streams are well within the statutory life of the patent portfolio. For the Base Case, I used the market projection for the Basic Microscope. In my opinion, the current patent portfolio has the best chance of success in this market as Yancy has already demonstrated the technology and a license to the Yancy technology would provide a microscope producer with a significant competitive advantage. The projected royalty base for the Basic Microscope begins at \$20 M per year two years from now, growing to \$1.7 B per year eight years from now before declining to \$1 B per year 11 years from now. As discussed above, in my experience, these market projections for the royalty base for a license to the patent portfolio appear to be reasonable.

I then determined the proper discount factor to use in determining the net present value of discounted cash flow of the future earnings attributable to the patent portfolio. A discount factor is used to account for the risk of future cash flow projections being achieved by an enterprise. Very speculative ventures may have discount factors in excess of 50-60%, whereas very low risk ventures may have discount rates of 10% or less.

I determined that a 40% discount factor was appropriate to use for the future cash flows attributable to the patent portfolio. This discount factor recognizes that there is risk in Yancy achieving future cash flow projections, but that risk is more typical of an early stage company with a working prototype of its product rather than a start up that has yet to file patents, develop a market entry strategy or build a working prototype. I based this determination on the following factors.

- Yancy's founders have considerable technical and market expertise in the microscope business (reduces risk);

- Yancy has filed a strong US patent application with broad coverage of the technology (reduces risk);
- Yancy's patent portfolio can build off of the initial filings and use a very favorable priority date to buttress the core patent (reduces risk);
- No prior art has yet been identified which could be used to reduce the scope of the claims of Yancy's patent portfolio (reduces risk);
- Yancy has developed a working prototype demonstrating the technology and its significant advantages over incumbent technologies using salvaged parts (reduces risk);
- The Basic Microscope market is growing as it recovers from the Great Recession, and Yancy's market opportunity in the Basic Microscope market is considerably larger than their projected penetration (reduces risk);
- Yancy's patent portfolio has no issued patents, and patents in prosecution may have their claims limited during the process (increases risk);
- Yancy does not yet have a potential licensee in negotiations, and it may take longer than planned to sign the first license and begin earning licensing revenue (increases risk);
- Yancy needs additional funding to make the next prototype and further advance the technology, and delays in obtaining that funding could delay the signing of the first license and earning licensing revenue (increases risk).

Finally, to determine the value of the patent portfolio under Base Case, I calculated the future cash flows attributable to the licensing of the patent portfolio and discounted those cash flows at the 40% discount factor. For each year's cash flow, I applied the 4.65 % comparable royalty rate to the projected Yancy revenues, then discounted the cash flows by the discount factor applied to that year (the discount factor compounds much like an interest rate, so cash flows from more distant years are discounted more than those in earlier years).

I determined that the valuation of the patent portfolio under the base case is \$20,657,803 as of February 9, 2015.

### **Additional Products – Valuation Under a Moderate Market Penetration Scenario**

I next considered a scenario where the Yancy patent portfolio is able to penetrate additional market segments as identified in Yancy's market projections. Based on my understanding of the underlying technology and the patent portfolio, I assumed that three additional products would be added to the product mix; Basic Telescopes, Research Telescopes and Desktop Research Systems.

For Basic Telescopes, Yancy projected selling licenses for 100 units per year, which amounts to a royalty base of about \$11M per year. First sales would be expected three years from now.

For Research Telescopes, Yancy projected selling licenses to 10 units in two years, falling to 5 units per year after four years and maintaining at that level. The royalty base would peak at \$100 M per year and decline to \$50 M per year.

For Desktop Research Systems (a medical research product), Yancy projected selling licenses for 1000 units three years from now, peaking at 10,000 units per year 12 years from now. The royalty base would begin at \$200 M per year and steadily grow to \$2+ B per year.

I applied a 3% royalty rate to the royalty base for this scenario. I performed another ktMine search and found numerous comparable licensing deals, with an average rate of 3.5%. I discounted this to 3% to account for my experience in similar medical research technologies, which is the bulk of the royalty base in this scenario.

I used a discount factor of 50% for this scenario. I increased the discount rate primarily because it is inherently much more difficult to successfully launch multiple licensing programs across multiple industries. Each industry has its own unique needs and expectations, and an early stage company such as Yancy will need additional funding, staff and relationships to execute this strategy. All of these factors increase the risk versus the Base Case, so the discount factor must also rise commensurate with the risk.

I determined that the patent portfolio would increase in value by \$11,101,548 for the successful licensing into these three additional products. Therefore, I determined that the valuation of the portfolio under this scenario as of February 10, 2015 is \$31,759,351.

#### **Additional Products – Valuation Under a High Market Penetration Scenario**

Finally, I considered a scenario where the Yancy patent portfolio is able to penetrate even more market segments as identified in Yancy's market projections. Based on my understanding of the underlying technology and the patent portfolio, I assumed that three additional products would be added to the product mix; Desktop Biological ID Systems, 3D Direct Write Lithography Systems and Portable Biomaterial ID Systems.

For Desktop Biological ID Systems, Yancy projects licensing 20 units two years from now, growing rapidly to 200,000 units 11 years from now. The royalty base starts small at \$625 K per year and peaks at \$8 B per year.

For 3D Direct Write Lithography Systems, Yancy projects licensing 100 units per year beginning six years from now and maintaining at that level. The royalty base is about \$1.6 B per year.

For Portable Biomaterial ID Systems, Yancy projects licensing 20 units per year beginning five years from now, with a peak of 100 units per year. The royalty base begins at about \$650 K per year and grows to about \$7 M per year.

I applied the 3% royalty rate I derived for the moderate market penetration scenario for the high market penetration scenario. In my experience, this rate would be applicable in the industries covered by these three products.

I used a discount factor of 70% for this scenario. As with the moderate market penetration scenario, the risks of launching even more licensing programs in even more industries (including semiconductor manufacturing tools with its long development cycles) are greater than the prior scenario, and a higher discount rate is warranted.

I determined that the patent portfolio would increase in value by another \$19,137,368 for the successful licensing into these three products. Therefore, I determined that the valuation of the portfolio under this scenario as of February 10, 2015 is \$50,896,719.

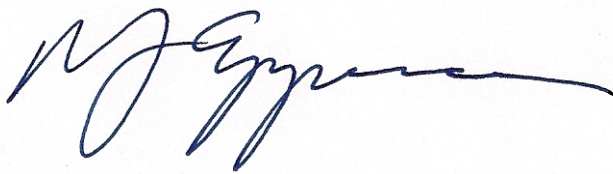
**Summary of the Valuation of the Yancy Corporation Patent Portfolio**

The valuation of the patent portfolio under the three scenarios described above is as follows:

Scenario	Valuation
Base Case	\$20,657,803
Additional Products – Moderate Market Penetration	\$31,759,351
Additional Products – High Market Penetration	\$50,896,719

It is my opinion that as of February 10, 2015, the valuation of the Yancy Corporation patent portfolio is between \$20,657,803 and \$50,896,719.

Sincerely,



Ron Epperson, CLP, CPVA  
Managing Director, Intellectual Energy LLC