



## AB118

### Training Proposal for: Applied Materials, Inc.

**Agreement Number: ET17-0801**

**Panel Meeting of:** October 28, 2016

**ETP Regional Office:** San Francisco Bay Area

**Analyst:** L. Lai

#### PROJECT PROFILE

Contract Attributes:	Retrainee Priority Rate AB118 (Alt Funds)	Industry Sector(s):	Green Technology Manufacturing  Priority Industry: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Counties Served:	Santa Clara	Repeat Contractor:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Union(s):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Number of Employees in:	CA: 3,908	U.S.: 8,394	Worldwide: 14,500
<u>Turnover Rate:</u>	8%		
<u>Managers/Supervisors:</u> (% of total trainees)	6%		

#### FUNDING DETAIL

Program Costs	-	(Substantial Contribution)	(High Earner Reduction)	=	<b>Total ETP Funding</b>
\$749,952		\$0	\$0		\$749,952

In-Kind Contribution:	100% of Total ETP Funding Required	\$1,604,064
-----------------------	------------------------------------	-------------

**TRAINING PLAN TABLE**

Job No.	Job Description	Type of Training	Estimated No. of Trainees	Range of Hours		Average Cost per Trainee	Post-Retention Wage
				Class / Lab	CBT		
1	Retrainee Priority Rate	Adv. Technology Computer Skills Con't Improve	434	8-200	0-23	\$1,728	\$26.25
				Weighted Avg: 96			

**Minimum Wage by County:** \$17.02 for Santa Clara County.

**Health Benefits:**  Yes  No This is employer share of cost for healthcare premiums – medical, dental, vision.

**Used to meet the Post-Retention Wage?:**  Yes  No  Maybe

Although employer provides health benefits, they are not being used to meet Post-Retention Wage.

**Wage Range by Occupation**

Occupation Titles	Wage Range	Estimated # of Trainees
Technician		64
Engineer		300
IT Staff		45
Manager		25

**INTRODUCTION**

Founded in 1967 and based in Santa Clara, Applied Materials, Inc. (Applied Materials) builds Nano manufacturing equipment, machines, and tools for global semiconductor, flat panel display and clean energy manufacturing industries. Customers include manufacturers of semiconductor wafers and chips (Intel), flat panel displays (Samsung), solar photovoltaic cells and modules (Yingli), and manufacturers of lithium-ion cell batteries (Panasonic).

**AB118**

This proposal will be funded under the AB 118 Training Program that was created in FY 2009-10. The AB 118 Program is administered by ETP in partnership with the California Energy Commission (CEC).

The overall goal of the AB 118 Program is to support a transition from petroleum-based transportation to alternative and renewable fuels and clean, low carbon vehicle technologies. There is no expenditure of Employment Training Tax funds for the AB 118 Program. Public entity employers are eligible to participate, such as city and county regional transit authorities.

Training is focused on job skills for a skilled workforce to produce and distribute new alternative fuels and design, construct, install, operate, service and maintain new fueling infrastructure and vehicles.

Alternative Fuel is defined as any fuel other than the traditional selections, gasoline and diesel from petroleum sources, used to produce energy or power. Examples of alternative fuels are: bio-diesel, ethanol, methanol, electricity, propane, compressed or liquid natural gas, and hydrogen.

## **PROJECT DETAILS**

Lithium-ion (Li-ion) batteries - the same kind of batteries used in cell phones and laptop computers - power most of today's electric vehicles (EVs). Li-ion battery technology is projected to be the leapfrog technology for the electrification of the drivetrain and to provide stationary storage solutions to enable the effective use of renewable energy sources. The technology is already in use for low power applications such as consumer electronics and power tools.

Affordable Li-ion car batteries have a driving range limited to 150 miles on a single charge and account for nearly 65% of the total cost of EVs. To compete in the market with gasoline-based vehicles, EVs must cost less and drive farther. An EV that is cost-competitive with gasoline would require a battery with twice the energy storage of today's state-of-the-art Li-ion battery at 30% of the cost.

Traditionally, the positive and negative terminals of Li-ion batteries are mixed with glue-like materials called binders, pressed onto electrodes, and then physically kept apart by winding a polymer mesh material between them called a separator. With the Applied Materials system, many of these labor-intensive processes will be replaced by automated next-generation coating. This will improve product reliability and performance of the cells at a fraction of the current cost. This will also increase the energy density of the battery and reduce the size of several of the battery's components to free up more space within the cell for storage.

Other innovations in battery manufacturing allow Applied Materials avoid reel-to-reel drying, which reduces the size of the factory required. This allows for a modular approach with reduced manufacturing costs.

This proposal aligns with and supports the legislative goals within the AB118 investment plan. The next-generation battery technology could potentially enable EVs to travel from San Jose to Los Angeles on a single charge.

## **Training Plan**

Training will be delivered by In-house subject matter experts via Class/Lab and Computer-Based Training (CBT).

**Advanced Technology (50%):** Training will be offered to all occupations. Courses include complex system modeling, materials sciences, Li-ion battery manufacturing architecture, systems engineering, software design and support systems, and product quality/reliability. Training will focus on leading-edge technology trends in Li-ion battery design, fabrication/manufacturing, modeling and integration. The Advanced Technology training in this proposal is new and is intended to foster a high level of innovation. Courses will be delivered by highly skilled internal Engineers at an estimated cost of over \$16,600 per day of training. The maximum ratio of 10 students per instructor would create the best learning environment for this training.

**Computer Skills (25%):** Training will be offered to all occupations. Courses include desktop applications, such as advanced levels of advanced desktop applications, personal productivity software applications, network development, and project management tools. Training will improve efficiency and data accuracy.

**Continuous Improvement (25%):** Training will be offered to all occupations. Courses include decision-making, corrective and preventative actions, management controls, process validations and complaint management systems. Quality training will teach employees how to better understand, measure, and reduce process variation using methodical problem solving techniques and statistics. Trainees will also learn to improve productivity and quality by identifying and eliminating waste from the value stream. Select Engineers will also learn how to manage projects, marketing communications, finance, and preparing effective oral and written presentations to customers. Domestic and International business regulations relating to clean energy, including the complexity of the Company's products and business transactions, dictate that effective customer communications and order accuracy must be achieved.

### **Commitment to Training**

ETP funds will not displace the existing financial commitment to training. The Company spent an estimated \$3,000,000 for training of its California workforce in 2015. The proposed training builds on, but does not overlap or replace, basic instruction and/or orientation type training already offered. Applied Materials currently funds all training in OSHA-mandated safety regulations, sexual harassment prevention, new hire orientation, rudimentary job skills, basic desktop application training (Microsoft Word, Excel and PowerPoint), and executive development programs. The resources provided by ETP will assist Applied Materials deliver supplemental and higher quality training courses. Safety training is provided in accordance with all pertinent requirements under state and federal law.

#### ➤ Training Infrastructure

Applied Materials utilizes a Learning Management System (LMS) to document all training. The LMS has been reviewed and approved by ETP staff for documentation purposes. Applied Materials has designated a staff person to oversee the ETP project and will use an administrative subcontractor to assist with project administration.

### **Substantial Contribution**

Because this project is being funded under AB118, substantial contribution requirement does not apply.

### **Prior Contracts**

Applied Materials has an active contract (ET15-0306) from 12/1/14 to 11/30/16. Of an estimated 415 trainees, 865 have been enrolled and 408 have received the minimum hours of training. ETP Online Class/Lab Tracking site shows there are sufficient hours to earn 100% of the approved amount of \$498,000, if the trainees meet all performance criteria.

Applied Materials had a contract (ET13-0323), from 03/04/13 to 03/03/15. Of an estimated 800 trainees, 3,333 were enrolled and 1,239 received the minimum hours of training. The Contractor earned the full approved amount of \$1,320,000.

### **RECOMMENDATION**

Staff recommends approval of this proposal.

**ACTIVE PROJECTS**

The following table summarizes performance by Applied Materials under an active ETP Agreement:

<b>Agreement No.</b>	<b>Approved Amount</b>	<b>Term</b>	<b>No. Trainees (Estimated)</b>	<b>No. Completed Training</b>	<b>No. Retained</b>
ET15-0802	\$598,500	12/1/14 – 11/30/16	350	920	920

Training and retention completed ahead of schedule. The closeout invoice was approved on 7/26/16, and the contractor earned 100% of the approved amount.

**DEVELOPMENT SERVICES**

Herrera & Company in Stockton assisted with development of this proposal at no cost to the Company.

**ADMINISTRATIVE SERVICES**

Herrera & Company will also perform administrative services in connection with this proposal for a fee not to exceed 13% of payment earned.

**TRAINING VENDORS**

To Be Determined

**Exhibit B: Menu Curriculum****Class/Lab Hours**

8 - 200

Trainees may receive any of the following:

**ADVANCED TECHNOLOGY**

- Application engineering services
- Casting anode and cathode plates
- Chemical-mechanical linearization technologies and applications
- Electromagnetic properties, waves and dielectric constants
- Factory automation tools and techniques
- Instrument modeling/integration software development
- Lithium surface/interaction overview
- Manufacturability for prismatic and cylindrical cells for LIBs
- Measurement sciences practice and theory
- Multipart machine automation development
- Multi-scale modeling for nonmaterial design
- Nano-scale device physics and technology
- Particle and energy balance in global models
- Photolithography, microlithography and optical lithography
- Physics of electrode coating
- Physics of radiofrequency plasmas
- Space plasma thrusters
- System data modeling and architecture
- Thin film surface/interaction overview

**COMPUTER SKILLS**

- Advanced desktop productivity applications
- Customer relationship management
- eBusiness applications
- Java program development
- Network infrastructure, security and firewall development
- Project management software tools
- Supply chain and manufacturing control systems

**CONTINUOUS IMPROVEMENT**

- Advanced customer communications and awareness
- Customer finance and buying decisions
- Design tools and practices
- Failure modes and effects analysis
- Marketing promotion and strategy
- Multi-cultural customer service relationships
- Problem solving tools and techniques
- Process improvement training
- Product marketing for engineers
- Product quality and reliability
- Technical presentation skills

**CBT Hours**

0 – 23

**COMPUTER SKILLS**

- Advanced desktop applications (2 hrs)
- ERP system training and reporting (1 hr)
- Programming languages (2 hrs)
- Project management software tools (1 hr)

**CONTINUOUS IMPROVEMENT**

- Advanced customer communications and awareness (2 hr)
- Design for excellence (2 hrs)
- Design tools and practices (1 hr)
- Effective teams (1 hr)
- Failure modes and effects analysis (1 hr)
- Marketing promotion and strategy (1.5 hr)
- Multi-cultural customer service relationships (1 hr)
- Problem solving tools and techniques (1 hr)
- Process improvement training (1.5 hrs)
- Product marketing for engineers (1 hr.)
- Product quality and reliability (1 hr)
- Quality fundamentals/core skills (1.5 hrs)
- Technical presentation skills (1 hr)

Note: Reimbursement for retraining is capped at 200 total training hours per trainee, regardless of the method of delivery. CBT is capped at 50% of total training hours, per trainee.