

## **Industries of the Future – West Virginia Proposals Submitted 1997 through 2008**

### **Aluminum**

#### **INTELLIGENT PROCESS OPTIMIZATION MANAGEMENT SYSTEM (IPOMS)**

**Research Team:** West Virginia University, Applied Industrial Solutions, Century Aluminum of West Virginia, Century Aluminum of Kentucky, Noranda Aluminum, Ormet Aluminum, University of Maryland, Ron Sheets & Associates, WestMar Design Systems, Oak Ridge National Laboratory, Amass Data

**Project PI:** Jan Berkow, Larry Banta  
**Agency:** U.S. Department of Energy

**Agency Request:** \$3,200,000  
**Cost Share:** \$3,200,000  
**Project Total:** \$6,400,000  
**Submitted:** April 2004  
**Status:** Not funded

#### **PLANT-WIDE ENERGY EFFICIENCY OPPORTUNITY ASSESSMENT FOR AN ALUMINUM ROLLING MILL (ASSESSMENT AT PECHINEY ROLLED PRODUCTS)**

**Research Team:** West Virginia University, Pechiney Rolled Products

**Project PI:** Larry Banta  
**Agency:** U.S. Department of Energy

**Agency Request:** \$ 82,678  
**Cost Share:** \$141,185  
**Project Total:** \$223,863  
**Submitted:** October 2001  
**Status:** Awarded  
**Award Date:** March 2002

#### **SPENT POTLINER TREATMENT TECHNOLOGY WITH BY-PRODUCT RECOVERY**

**Research Team:** West Virginia University, Argonne National Laboratory, Hydromet Environmental Hamilton, Century Aluminum of West Virginia, Inco Tech Kingston, Davis Laboratories

**Project PI:** E.H. Cho  
**Agency:** U.S. Department of Energy

**Agency Request:** \$2,000,000  
**Cost Share:** \$1,000,000  
**Project Total:** \$3,000,000  
**Submitted:** May 2001  
**Status:** Not funded

## **INTELLIGENT POTROOM OPERATION**

**Research Team:** West Virginia University, Applied Industrial Solutions, Century Aluminum of West Virginia  
**Project PI:** Larry Banta  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$1,800,000  
**Cost Share:** \$ 632,000  
**Project Total:** \$2,432,000  
**Submitted:** May 2000  
**Status:** Awarded  
**Award Date:** September 2000

## **Steel**

### **TECHNOLOGY SURVEY – CORROSION PHENOMENA AND PREVENTION**

**Research Team:** West Virginia University, American Iron & Steel Institute  
**Project PI:** Carl Irwin  
**Agency:** American Iron & Steel Institute  
**Project Total:** \$25,000  
**Submitted:** June 2007  
**Status:** Awarded  
**Award Date:** September 2007

### **PHOSPHOR THERMOMETRY FOR ENERGY EFFICIENT GALVANIZE, GALVANNEAL, GALVALUME HOT-DIP PROCESSES (PRE-PROPOSAL)**

**Research Team:** West Virginia University, Oak Ridge National Laboratory  
**Project PI:** B. Gopalakrishnan, Carl Irwin  
**Agency:** U.S. DOE EPSCoR  
**Project Total:** \$450,000  
**Submitted:** May 2007  
**Status:** Not accepted for full proposal

### **DEVELOP AN ALLOY WITH 100 MPA| 100,000 HOURS LIFE AT 760°C WITH PROVEN LONG-TERM STABILITY AND RESISTANCE TO COAL-ASH CORROSION ENVIRONMENT FOR NEXT GENERATION ULTRASUPERCRITICAL STEAM BOILER APPLICATION**

**Research Team:** West Virginia University, Special Metals Corporation  
**Project PI:** Xingbo Liu  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$339,008  
**Cost Share:** \$ 97,872  
**Project Total:** \$436,880  
**Submitted:** February 2004  
**Status:** Not funded

## **MODELING AND PROCESSING TECHNOLOGIES FOR ADVANCED INDUSTRIAL MATERIALS**

**Research Team:** West Virginia University  
**Project PI:** Keh-Minn Chang  
**Agency:** WV Higher Education Policy Commission  
**Project Total:** \$2,325,000  
**Submitted:** June 2002  
**Status:** Not funded

## **PREDICTIVE TECHNOLOGY TO PREVENT SOLIDIFICATION DEFECTS FOR LARGE CASTINGS USED IN ADVANCED ELECTRIC POWER SYSTEMS (PRE-PROPOSAL)**

**Research Team:** West Virginia University, Special Metals Corporation, GE Power Systems  
**Project PI:** Keh-Minn Chang, Xingbo Liu  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$ 840,000  
**Cost Share:** \$ 210,000  
**Project Total:** \$1,050,000  
**Submitted:** July 2001  
**Status:** Accepted for full proposal submission

## **PREDICTIVE TECHNOLOGY TO PREVENT SOLIDIFICATION DEFECTS FOR LARGE CASTINGS USED IN ADVANCED ELECTRIC POWER SYSTEMS**

**Research Team:** West Virginia University, Special Metals Corporation, GE Power Systems  
**Project PI:** Keh-Minn Chang, Xingbo Liu  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$ 840,000  
**Cost Share:** \$ 210,000  
**Project Total:** \$1,050,000  
**Submitted:** July 2001  
**Status:** Not funded

## **WEIRTON STEEL CORPORATION ENERGY EFFICIENCY AND ADVANCED POWER GENERATION SYSTEM**

**Research Team:** West Virginia Development Office, West Virginia University, Allegheny Energy Solutions, Augusta Systems, Weirton Steel Corp., U.S. DOE National Energy Technology Laboratory  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$796,000  
**Cost Share:** \$202,000  
**Project Total:** \$998,000  
**Submitted:** May 2001  
**Status:** Accepted for full proposal submission

## **LIFE IMPROVEMENT OF POT HARDWARE IN CONTINUOUS HOT DIPPING PROCESSES**

**Research Team:** West Virginia University, Oak Ridge National Laboratory, International Lead and Zinc Research organization Inc., Bethlehem Steel Corp., Stoodly Company, Duraloy Dynamics Inc., Deloro Stellite Company Inc., Steel Dynamics Inc., Fontaine Engineering Inc., Galv Pro, Weirton Steel Corp., National Steel, Wheeling- Nisshin

**Project PI:** Keh-Minn Chang, Ever Barbero  
**Agency:** U.S. Department of Energy

**Agency Request:** \$2,326,000  
**Cost Share:** \$2,326,000  
**Project Total:** \$4,652,000

**Submitted:** January 2001  
**Status:** Awarded  
**Award Date:** May 2001

## **IMPROVED MATERIALS FOR GALVANIZING LINE HARDWARE**

**Research Team:** Weirton Steel, International Lead & Zinc Research Organization, West Virginia Steel Futures, Wheeling-Nisshin Steel, Bethlehem Steel, California Steel Industries, Duraloy Technologies, Fontaine Engineering, Inc., Steel Dynamic, Inc., GalvPro, Stoodly Company, Deloro Stellite, Inc., Metallics Systems Company, National Steel Corporation, Praxair Surface Technologies, TeckCominco, Ellison Surface Technologies, ASB Industries, Vesuvius McDanel, AK Steel, Industries of the Future, Oak Ridge National Laboratory, West Virginia University

**Project PI:** Keh-Minn Chang  
**Agency:** U.S. Department of Energy

**Agency Request:** \$2,326,000  
**Cost Share:** \$2,326,000  
**Project Total:** \$4,652,000

**Submitted:** September 2000  
**Status:** Awarded

## **PLANT-WIDE ENERGY ASSESSMENT AT WEIRTON STEEL CORPORATION**

**Research Team:** Weirton Steel, West Virginia University

**Project PI:** B. Gopalakrishnan  
**Agency:** U.S. Department of Energy

**Agency Request:** \$100,000  
**Cost Share:** \$100,000  
**Project Total:** \$200,000

**Submitted:** May 2000  
**Status:** Awarded  
**Award Date:** September 2001

## **NEW MATERIAL RESEARCH AND LIFE IMPROVEMENT FOR POT HARDWARE IN CONTINUOUS DRIPPING PROCESS (1999 STEEL SOLICITATION)**

**Research Team:** West Virginia University, West Virginia Steel Futures, Wheeling-Nisshin, Wheeling-Pittsburgh Steel Corporation, Steel of West Virginia, Inc., AmeriSteel, West Virginia AFL-CIO, United Steel Workers Union, Oak Ridge National Laboratory

**Project PI:** Keh-Minn Chang  
**Agency:** U.S. Department of Energy

**Agency Request:** \$3,157,106  
**Cost Share:** \$1,043,133  
**Project Total:** \$4,200,239

**Submitted:** March 1999  
**Status:** Not funded

## **EVALUATION OF MATERIALS FOR USE IN ZN-AL LIQUID METAL COATING SYSTEMS**

**Research Team:** West Virginia University

**Project PI:** B. Gopalakrishnan  
**Agency:** U.S. Department of Energy

**Project Total:** \$25,000

**Submitted:** February 1999  
**Status:** Awarded  
**Award Date:** February 1999

## **THE MANUFACTURE AND COMMERCIALIZATION OF AN ENVIRONMENTALLY FRIENDLY OXIDE REMOVAL PROCESS TO REPLACE ACID PICKLING IN FLAT ROLLED STEEL MANUFACTURING**

**Research Team:** International Processing Systems, Inc.

**Project PI:** Jeff Herholdt  
**Agency:** U.S. DOE NICE3

**Agency Request:** \$ 400,000  
**Cost Share:** \$1,587,000  
**Project Total:** \$1,987,000

**Submitted:** October 1998  
**Status:** Not funded

## **UTILITIES ENERGY CONSERVATION PROJECT LEVEL II CONTROL OF MULTIPLE OPERATIONS**

**Research Team:** Weirton Steel, West Virginia Development Office

**Project PI:** Jeff Herholdt  
**Agency:** U.S. DOE NICE3

**Agency Request:** \$ 400,000  
**Cost Share:** \$2,500,000  
**Project Total:** \$2,900,000

**Submitted:** October 1998  
**Status:** Not funded

### **HOT STRIP MILL TRANSFER BAR RAPIDFIRE EDGE HEAT PROJECT**

**Research Team:** Weirton Steel, West Virginia Development Office  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. DOE NICE3  
**Agency Request:** \$ 400,000  
**Cost Share:** \$1,095,000  
**Project Total:** \$1,495,000  
**Submitted:** September 1998  
**Status:** Awarded

### **EVALUATION OF LIQUID-METAL CORROSION IN CONTINUOUS GALVANIZING LINES**

**Research Team:** West Virginia University, Oak Ridge National Laboratory, Weirton Steel Corporation, Wheeling-Nisshin, Inc.  
**Project PI:** B. Gopalakrishnan, Keh-Minn Chang  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$39,461  
**Cost Share:** \$14,930  
**Project Total:** \$54,391  
**Submitted:** May 1998  
**Status:** Awarded

### **HOT MILL TRANSFER BAR EDGE HEATING PROJECT (PRE-PROPOSAL)**

**Research Team:** Weirton Steel, West Virginia Development Office  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. DOE NICE3  
**Project Total:** \$400,000  
**Submitted:** May 1998  
**Status:** Accepted for full proposal submission

### **TIN MILL BATCH ANNEALING MICROPROCESSOR CONTROL AND IMPROVED HEAT TRANSFER PROJECT (PRE-PROPOSAL)**

**Research Team:** Weirton Steel, West Virginia Development Office  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. DOE NICE3  
**Project Total:** \$400,000  
**Submitted:** May 1998  
**Status:** Not funded

## **Metal Casting**

### **PROPOSAL FOR A NEW RAPID MANUFACTURING MACHINE TO MAKE SAND MOLDS FOR METAL CASTING**

**Research Team:** West Virginia University  
**Project PI:** Robert Creese  
**Agency:** Defense University Research Instrumentation Program  
**Project Total:** \$104,950  
**Submitted:** September 2006  
**Status:** Not funded

### **CONTROL PRESSURE CASTING OF CAST IRONS**

**Research Team:** West Virginia University, Oak Ridge National Laboratory, HK Casting Inc., Citation, BuyCASTING.com, Kingsport Foundry & Manufacturing Corp., MAGMA, ESI North America, Energy Industries of Ohio  
**Project PI:** Robert Creese  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$1,484,765  
**Cost Share:** \$1,485,000  
**Project Total:** \$2,969,765  
**Submitted:** May 2003  
**Status:** Not funded

### **LOW PRESSURE BOTTOM POUR BRONZE CASTING**

**Research Team:** West Virginia University, York Bronze  
**Project PI:** Tom Mahoney  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$120,000  
**Cost Share:** \$ 30,000  
**Project Total:** \$150,000  
**Submitted:** May 2001  
**Status:** Accepted for full proposal submission

### **RE-USE OF FOUNDRY SAND IN FLOWABLE FILL AND OTHER ENGINEERING APPLICATIONS (PRE-PROPOSAL)**

**Research Team:** West Virginia University, HK Castings Inc.  
**Project PI:** Robert Creese, Hema J. Siriwardane  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$192,000  
**Cost Share:** \$ 48,000  
**Project Total:** \$240,000  
**Submitted:** May 2001  
**Status:** Accepted for full proposal submission

## **USE OF FOUNDRY SAND IN FLOWABLE FILL AND OTHER ENGINEERING APPLICATIONS**

**Research Team:** West Virginia University, Sturm Inc., HK Casting, Inc.  
**Project PI:** Robert Creese  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$237,624  
**Cost Share:** \$ 60,308  
**Project Total:** \$297,932  
**Submitted:** July 2001  
**Status:** Not funded

## **Glass**

### **GLASS INDUSTRY ASSISTANCE PROGRAM**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Glass Industry  
**Project PI:** Larry Banta  
**Agency:** West Virginia Development Office  
**Project Total:** \$90,000  
**Submitted:** June 2006, June 2004  
**Status:** Awarded  
**Award Date:** October 2006, October 2004

### **GLASS INDUSTRY ASSISTANCE PROGRAM**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Glass Industry  
**Project PI:** Larry Banta  
**Agency:** West Virginia Development Office  
**Project Total:** \$90,000  
**Submitted:** June 2004  
**Status:** Awarded  
**Award Date:** October 2004

### **SPECTRAL ANALYSIS AND IMAGING OF COLORED GLASS**

**Research Team:** Judel Products, Oak Ridge National Laboratory, Society for Glass Science and Practices, Glass Manufacturing Industry Council, West Virginia University  
**Project PI:** Ed Sneckenberger, Tom Mason  
**Agency:** U.S. Department of Energy  
**Project Total:** \$25,000  
**Submitted:** November 2003  
**Status:** Awarded  
**Award Date:** January 2004

### **USE OF ENHANCED REFRACTORY FOR A GLASS INDUSTRY COMPANY**

**Research Team:** AFG Industries, Corhart Refractories, U.S. DOE Argonne National Laboratory, West Virginia University  
**Project PI:** Ed Sneckenberger  
**Agency:** U.S. Department of Energy  
**Project Total:** \$25,000  
**Submitted:** October 2003  
**Status:** Not funded

### **GLASS COATING ENHANCEMENT**

**Research Team:** Marble King, Oak Ridge National Laboratory  
**Project PI:** Ed Sneckenberger, Beri Fox  
**Agency:** U.S. Department of Energy  
**Project Total:** \$25,000  
**Submitted:** October 2003  
**Status:** Awarded  
**Award Date:** January 2004

### **ADVANCED SPECTRAL IMAGING AND SENSING TECHNIQUES FOR INTELLIGENT CONTROL OF GLASS FORMING AND PROCESSING**

**Research Team:** West Virginia University, Judel Products Inc., Oak Ridge National Laboratory, University of Missouri-Rolla, L.E. Smith Glass Company, Society for Glass Science and Practices  
**Project PI:** Ed Sneckenberger  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$ 725,000  
**Cost Share:** \$ 500,000  
**Project Total:** \$1,225,000  
**Submitted:** January 2003  
**Status:** Not funded

### **GLASS INDUSTRY ASSISTANCE PROGRAM**

**Research Team:** West Virginia University, West Virginia Development Office Charleston, West Virginia Glass Industry  
**Project PI:** Ed Sneckenberger, Larry Banta  
**Agency:** West Virginia Development Office  
**Project Total:** \$80,000  
**Submitted:** June 2002  
**Status:** Awarded  
**Award Date:** October 2002

### **REDUCTION IN CORROSION REFRACTORIES USING ENCAPSULATED GLASS ADDITIVES**

**Research Team:** Kopp Glass, Argonne National Laboratory, Glass Manufacturing Industry Council, Society for Glass Science and Practices, West Virginia University

**Project PI:** Ed Sneckenberger, James Kroner  
**Agency:** U.S. Department of Energy

**Project Total:** \$25,000  
**Submitted:** June 2001  
**Status:** Awarded  
**Award Date:** June 2001

### **REDUCTION OF GLASS TANK REFRACTORY BY IMPROVED ENCAPSULATION OF ADDITIVES**

**Research Team:** West Virginia University, Judel Glass, Oak Ridge National Laboratory, Larew Technical Services

**Project PI:** Ed Sneckenberger  
**Agency:** U.S. Department of Energy

**Agency Request:** \$400,000  
**Cost Share:** \$ 80,000  
**Project Total:** \$480,000  
**Submitted:** May 2001  
**Status:** Not accepted for full proposal

### **REDUCTION IN CORROSION OF TANK REFRACTORY USING ENCAPSULATED GLASS ADDITIVES**

**Research Team:** West Virginia University, Kopp Glass, Argonne National Laboratory, Society for Glass Science & Practices

**Project PI:** Ed Sneckenberger, James Kroner  
**Agency:** U.S. Department of Energy

**Project Total:** \$25,000  
**Submitted:** February 2001  
**Status:** Awarded  
**Award Date:** August 2001

### **GLASS INDUSTRY ASSISTANCE PROGRAM**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Glass Industry

**Project PI:** Ed Sneckenberger  
**Agency:** U.S. Department of Energy

**Project Total:** \$80,000  
**Submitted:** June 2000  
**Status:** Awarded  
**Award Date:** October 2000

### **ENHANCED CUTTING AND FINISHING OF HANDGLASS USING A CO2 LASER**

**Research Team:** West Virginia University, U.S. DOE National Energy Technology Laboratory, Fenton Art Glass

**Project PI:** Ed Sneckenberger  
**Agency:** U.S. Department of Energy

**Agency Request:** \$352,000  
**Cost Share:** \$176,000  
**Project Total:** \$528,000

**Submitted:** May 1999  
**Status:** Awarded  
**Award Date:** September 1999

### **FIBERGLASS WASTE MINIMIZATION**

**Research Team:** Johns Manville, West Virginia Development Office

**Project PI:** Jeff Herholdt  
**Agency:** U.S. DOE NICE3

**Agency Request:** \$200,000  
**Cost Share:** \$100,000  
**Project Total:** \$300,000

**Submitted:** March 1999  
**Status:** Not funded

### **GLASS INDUSTRY ASSISTANCE PROGRAM**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Glass Industry

**Project PI:** Ed Sneckenberger  
**Agency:** U.S. Department of Energy

**Project Total:** \$80,000  
**Submitted:** October 1998  
**Status:** Awarded  
**Award Date:** February 1999

### **GLASS INDUSTRY ASSISTANCE PROGRAM**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Glass Industry

**Project PI:** Ed Sneckenberger  
**Agency:** U.S. Department of Energy

**Project Total:** \$80,000  
**Submitted:** October 1997  
**Status:** Awarded  
**Award Date:** February 1997

## **REFRACTORY CORROSION CONTROL**

**Research Team:** West Virginia University, Society of Glass Science and Practices  
**Project PI:** Ed Sneckenberger  
**Agency:** U.S. DOE Partnerships for Academic-Industrial Research (PAIR)  
**Submitted:** November 1997  
**Status:** Not accepted for full proposal

## **Chemicals/ Polymers**

### **EVOH NANOCOMPOSITE BARRIER LAYER**

**Research Team:** West Virginia University  
**Project PIs:** Rakesh Gupta and Ed Crowe  
**Agency:** Nine Sigma  
**Project Total:** \$48,940  
**Submitted:** October 2007  
**Status:** Not funded

### **STIFF AND DURABLE WOOD-PLASTIC COMPOSITES THROUGH HYBRID PROCESSING**

**Research Team:** West Virginia University, the University of British Columbia, Universidad Nacional Autonoma de Mexico, Escola Politencnica de Universidad Sao Paulo, Wildi Compounding Technologies, LLC, SDR Technologies, LLC, Polymer Alliance Zone of West Virginia  
**Project PI:** Rakesh Gupta  
**Agency:** National Science Foundation  
**Agency Request:** \$297,824  
**Cost Share:** \$ 2,986  
**Project Total:** \$300,810  
**Submitted:** September 2006  
**Status:** Not funded

### **SUB-MICRON-SIZED EMULSIONS VIA EXTENSIONAL MIXING**

**Research Team:** West Virginia University, Kraft Foods  
**Project PI:** Rakesh Gupta  
**Agency:** Kraft Foods Research  
**Project Total:** \$81,130  
**Submitted:** September 2006  
**Status:** Awarded at a lower funding level  
**Award Date:** July 2007

### **ELASTIC POLYETHYLENE FILM WITH AN EXTENSILE LIMIT**

**Research Team:** West Virginia University  
**Project PI:** Rakesh Gupta  
**Agency:** Nine Sigma  
**Project Total:** \$69,954  
**Submitted:** July 2006  
**Status:** Not funded

### **COOPERATIVE EXTRUSION PROJECT WITH EXCEL POLYMERS**

**Research Team:** West Virginia University, Excel Polymers  
**Project PI:** Rakesh Gupta  
**Agency:** Excel Polymers  
**Project Total:** \$20,000  
**Submitted:** June 2006  
**Status:** Awarded  
**Award Date:** April 2006

### **HEALTH EFFECTS OF NANOPARTICLES IN MANUFACTURING**

**Research Team:** West Virginia University  
**Project PI:** Rakesh Gupta  
**Agency:** WV EPSCoR Research Group Initiation  
**Project Total:** \$50,000  
**Submitted:** February 2006  
**Status:** Not funded

### **POLYMER-WOOD-NANOCLAY COMPOSITES FOR INFRASTRUCTURE APPLICATIONS**

**Research Team:** West Virginia University, Tulane University  
**Project PI:** Rakesh Gupta  
**Agency:** Tulane University  
**Project Total:** \$151,755  
**Submitted:** February 2006  
**Status:** Not funded

### **PULMONARY TOXICITY OF NANOMATERIALS**

**Research Team:** West Virginia University  
**Project PI:** Rakesh Gupta  
**Agency:** U.S. Environmental Protection Agency  
**Project Total:** \$399,000  
**Submitted:** February 2006  
**Status:** Not funded

### **USING NANOMATERIALS IN THE WORKPLACE**

**Research Team:** West Virginia University, WVU Health Sciences Center  
**Project PI:** Rakesh Gupta  
**Agency:** WV EPSCoR Research Group Initiation  
**Project Total:** \$50,000  
**Submitted:** February 2006  
**Status:** Not funded

### **AN INEXPENSIVE POLYMER MODIFIED ASPHALT FOR ROADWAY PAVING**

**Research Team:** West Virginia University  
**Project PI:** Rakesh Gupta  
**Agency:** WVU Research Corporation  
**Project Total:** \$43,276  
**Submitted:** January 2006  
**Status:** Not funded

### **HEALTH EFFECTS OF MANUFACTURED NANOMATERIALS**

**Research Team:** West Virginia University, WVU Health Sciences Center, NIOSH  
**Project PI:** Rakesh Gupta  
**Agency:** WVU Research Corporation  
**Project Total:** \$45,400  
**Submitted:** December 2005  
**Status:** Not funded

### **USE OF CARBON NANOFIBERS TO IMPROVE HEAT CONDUCTION IN THERMAL INTERFACE MATERIALS**

**Research Team:** West Virginia University  
**Project PI:** Rakesh Gupta  
**Agency:** ICI/National Starch  
**Project Total:** \$254,400  
**Submitted:** September 2005  
**Status:** Not funded

### **WATER BASED PRESSURE SENSITIVE ADHESIVES THAT ARE EASILY REMOVED FROM RECYCLED PAPER PULP**

**Research Team:** Dyna-Tech Adhesives, West Virginia University  
**Project PI:** Earl Melby and Rakesh Gupta  
**Agency:** U.S. Environmental Protection Agency SBIR  
**Project Total:** \$70,000  
**Submitted:** May 2005  
**Status:** Not funded

**U.S. DEPARTMENT OF ENERGY INDUSTRIAL TECHNOLOGIES PROGRAM – TECHNOLOGY DELIVERY  
PLANT-WIDE ASSESSMENT AT PPG INDUSTRIES, NATRIUM, WV**

**Research Team:** West Virginia University, PPG

**Project PI:** Bill Johnson

**Agency:** U.S. Department of Energy

**Agency Request:** \$100,000

**Cost Share:** \$108,000

**Project Total:** \$208,000

**Submitted:** July 2004

**Status:** Awarded

**Award Date:** May 2005

**BRIDGE RESEARCH ON ADVANCED FISCHER-TROPSCH CATALYSTS FOR OXYGENATED AND  
HYDROCARBON FUELS AND CHEMICALS FROM SYNTHESIS GAS (PRE-PROPOSAL)**

**Research Team:** West Virginia University, Center for Applied Energy Research, University of  
Kentucky

**Project PI:** Dady Dadyburjor

**Agency:** U.S. Department of Energy STAC

**Agency Request:** \$400,000

**Cost Share:** \$100,000

**Project Total:** \$500,000

**Submitted:** May 2004

**Status:** Not accepted for full proposal

**DEVELOPMENT OF AN ULTRA-FINE COAL DEWATERING TECHNOLOGY AND AN INTEGRATED  
FLOTATION DEWATERING SYSTEM FOR COAL PREPARATION PLANT**

**Research Team:** West Virginia University, Lascar Ltd., Mineral Technologies International Inc.,  
Callahan Corporation, Duvall Bros Inc.

**Project PI:** Wu Zang

**Agency:** U.S. Department of Energy

**Agency Request:** \$79,984

**Cost Share:** \$20,000

**Project Total:** \$99,984

**Submitted:** May 2004

**Status:** Awarded

**Award Date:** May 2004

**VISCOUS FINGERING AND CROSS-OVER TO DARCY FLOW DURING CO<sub>2</sub> SEQUESTRATION**

**Research Team:** West Virginia University, Case Western Reserve University

**Project PI:** Martin Ferer

**Agency:** U.S. Department of Energy STAC

**Agency Request:** \$664,343

**Cost Share:** \$168,158

**Project Total:** \$832,501

**Submitted:** May 2004

**Status:** Not accepted for full proposal

## **VISCOELASTICITY AND VISCOPLASTICITY OF POLYMER-CLAY NANOCOMPOSITES UNDER NON-MONOTONIC LOADING WITH FINITE STRAINS**

**Research Team:** West Virginia University  
**Project PI:** Rakesh Gupta  
**Agency:** Petroleum Research Fund  
**Project Total:** \$80,000  
**Submitted:** March 2004  
**Status:** Not funded

## **ADVANCED COMPOSITE STRUCTURAL MEMBERS FOR TALL NARROW STRUCTURES**

**Research Team:** The Constructed Facilities Center, Bedford Reinforced Plastics, Inc.  
**Project PI:** GangaRao Hota  
**Agency:** Air Force Research Office  
**Agency Request:** \$ 99,554  
**Cost Share:** \$100,000  
**Project Total:** \$199,554  
**Submitted:** February 2004  
**Status:** Not funded

## **DIRECTED ASSEMBLY OF MULTIFUNCTIONAL NANOSTRUCTURED MATERIALS (PRE-PROPOSAL)**

**Research Team:** West Virginia University  
**Project PI:** Carl Irwin  
**Agency:** West Virginia University Research Corporation  
**Submitted:** February 2004  
**Status:** Not accepted for full proposal

## **ADVANCED TECHNOLOGIES AND PROCESSES FOR MANUFACTURING ENERGY-EFFICIENT, HIGH PERFORMANCE WOOD COMPOSITE LUMBER**

**Research Team:** West Virginia University ,Tulane University, University of Maine, Oak Ridge National Laboratory, USDA Forest Products Laboratory, Industries of the Future-West Virginia, West Virginia Forestry Association, West Virginia Development Office, Ashland Specialty Chemical Company, Crompton Corporation, Exxon Mobil Futuresoft Technologies Inc., Louisiana Pacific Corporation  
**Project PI:** Bill Johnson, Ben Dawson-Andon  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$2,361,514  
**Cost Share:** \$1,254,201  
**Project Total:** \$3,615,715  
**Submitted:** January 2004  
**Status:** Awarded at a lower funding level  
**Award Date:** January 2005

## **DEVELOPMENT OF NOVEL CATALYSTS FOR THE OXIDATION OF METHANE TO METHANOL WITH HIGH SELECTIVITY AND THROUGHPUT**

**Research Team:** Chemical Alliance Zone, DOW, Engelhard, Equistar, UOP, Oak Ridge National Laboratory, West Virginia University, Rampant Technology Partners, LLC, MATRIC, Kellogg Brown & Root, Inc., C3, Energy Industries of Ohio

**Project PI:** John Maher

**Agency:** U.S. Department of Energy

**Agency Request:** \$5,000,000

**Cost Share:** \$4,111,800

**Project Total:** \$9,111,800

**Submitted:** January 2004

**Status:** Not funded

## **ADVANCED FIBER REINFORCED POLYMER COMPOSITES USING NANORESINS AND 3-D FABRICS**

**Research Team:** West Virginia University, Bedford Plastics, Owens Corning Science and Technology Center, Ashland Distribution Company, Nautilus LLP, EPRI, West Virginia Department of Transportation

**Project PI:** GangaRao Hota

**Agency:** U.S. Department of Energy

**Agency Request:** \$ 901,882

**Cost Share:** \$ 630,000

**Project Total:** \$1,531,882

**Submitted:** February 2003

**Status:** Not funded

## **UNIVERSITY-INDUSTRY CENTER FOR EXTRUSION-COMPOUNDING OF ADDITIVES FOR SUPERIOR PLASTICS PERFORMANCE**

**Research Team:** West Virginia University

**Project PI:** Rakesh Gupta

**Agency:** WV Higher Education Policy Commission

**Agency Request:** \$1,500,000

**Cost Share:** \$ 11,547

**Project Total:** \$1,511,547

**Submitted:** June 2002

**Status:** Awarded

**Award Date:** September 2002

**DEVELOPMENT OF ENERGY EFFICIENT POLYMER ADDITIVE BLENDS OF A NEW SHAPE/FORM RESULTING IN LOWER ADDITIVE USAGE, MINIMAL WASTE, AND ENHANCED PRODUCTIVITY**

**Research Team:** West Virginia University, GE Specialty Chemicals, Wildi Compounding Composites, Basell USA, Inc., Polymer Alliance Zone, Chemical Alliance Zone

**Project PI:** Rakesh Gupta  
**Agency:** U.S. Department of Energy

**Agency Request:** \$380,078  
**Cost Share:** \$416,311  
**Project Total:** \$796,389

**Submitted:** April 2002  
**Status:** Not funded

**ENERGY EFFICIENT PROCESSES FOR MAKING TACKIFIER DISPERSIONS USED TO MAKE PRESSURE SENSITIVE ADHESIVES**

**Research Team:** West Virginia University, Dyna-Tech Adhesives, Argonne National Laboratory, Tulane University Chemical Engineering, Charles Ross & Son Company, Mays Microsystems Inc.

**Project PI:** Rakesh Gupta  
**Agency:** U.S. Department of Energy

**Agency Request:** \$1,395,260  
**Cost Share:** \$1,395,260  
**Project Total:** \$2,790,520

**Submitted:** April 2002  
**Status:** Awarded  
**Award Date:** May 2003

**FIBER REINFORCED POLYMER COMPOSITE UTILITY POLES**

**Research Team:** West Virginia University, Bedford Reinforced Plastics, Owens Corning Science & Technology Center, Ashland Distribution Company, Nautilus LLP, EPRI American Electric Power

**Project PI:** GangaRao Hota  
**Agency:** U.S. Department of Energy

**Agency Request:** \$ 900,000  
**Cost Share:** \$ 900,000  
**Project Total:** \$1,800,000

**Submitted:** April 2002  
**Status:** Not funded

### **IMPROVED PROCESSES FOR MAKING TACKIFIER DISPERSIONS USED IN PRESSURE-SENSITIVE ADHESIVES**

**Research Team:** West Virginia University, Dyna-Tech Adhesives  
**Project PI:** Rakesh Gupta  
**Agency:** West Virginia Higher Education Policy Commission  
**Agency Request:** \$128,000  
**Cost Share:** \$ 64,000  
**Project Total:** \$192,000  
**Submitted:** September 2001  
**Status:** Awarded at a lower funding level  
**Award Date:** October 2001

### **DEVELOPMENT OF AN EFFICIENT AND COST-EFFECTIVE CLAY PURIFICATION PROCESS**

**Research Team:** West Virginia University, Elementis Specialties, Argonne National Laboratory  
**Project PI:** Rakesh Gupta  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$1,000,000  
**Cost Share:** \$ 300,000  
**Project Total:** \$1,300,000  
**Submitted:** July 2001  
**Status:** Not funded

### **NOVEL PROCESSES FOR PRODUCTION OF LOW-DUST POLYMER ADDITIVES OFFERING MINIMAL WASTE AND ENHANCED PRODUCTIVITY**

**Research Team:** West Virginia University, GE Specialty Chemicals  
**Project PI:** Rakesh Gupta  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$500,000  
**Cost Share:** \$210,000  
**Project Total:** \$710,000  
**Submitted:** July 2001  
**Status:** Not funded

### **DEVELOPMENT OF AN EFFICIENT AND COST EFFECTIVE CLAY PURIFICATION PROCESS USING FROTH FLOTATION AND DEFLOCCULATION TECHNIQUES**

**Research Team:** Elementis Specialties, Argonne National Laboratory, West Virginia University  
**Project PI:** Rakesh Gupta  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$ 900,000  
**Cost Share:** \$ 300,000  
**Project Total:** \$1,200,000  
**Submitted:** July 2001  
**Status:** Not funded

## **NOVEL PROCESSES FOR PRODUCTION OF LOW-DUST POLYMER ADDITIVES OFFERING MINIMAL WASTE AND ENHANCED PRODUCTIVITY (PRE-PROPOSAL)**

**Research Team:** West Virginia University, West Virginia Development Office, GE Specialty Chemicals  
**Project PI:** Rakesh Gupta  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$ 900,000  
**Cost Share:** \$ 530,000  
**Project Total:** \$1,430,000  
**Submitted:** May 2001  
**Status:** accepted for full proposal submission

## **EXTENSIONAL VISCOSITY OF PLED FLUIDS**

**Research Team:** West Virginia University, DuPont  
**Project PI:** Rakesh Gupta  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$35,000  
**Cost Share:** \$35,000  
**Project Total:** \$70,000  
**Submitted:** January 2001  
**Status:** Awarded  
**Award Date:** May 2001

## **PLANT-WIDE ENERGY EFFICIENCY OPPORTUNITY ASSESSMENT AT THE NEW MARTINSVILLE, WV BAYER PLANT**

**Research Team:** Bayer Corporation, West Virginia University  
**Project PI:** Richard Turton  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$100,000  
**Cost Share:** \$100,000  
**Project Total:** \$200,000  
**Submitted:** November 2000  
**Status:** Awarded  
**Award Date:** March 2001

## **SEPARATION AND RECOVERY OF THERMOPLASTICS FOR RE-USE VIA FROTH FLOTATION FROM NYLON PRODUCTION WASTE STREAMS**

**Research Team:** West Virginia University, SDR Plastics  
**Project PI:** Rakesh Gupta  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$100,000  
**Cost Share:** \$100,000  
**Project Total:** \$200,000  
**Submitted:** January 2000  
**Status:** Awarded  
**Award Date:** October 2000

## **Wood/Forest Products**

### **WOOD RESIDUE SURVEY 2008**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Joseph McNeel  
**Agency:** West Virginia Development Office  
**Project Total:** \$10,000  
**Submitted:** July 2007  
**Status:** Awarded  
**Award Date:** October 2007

### **DEVELOPMENT OF AN OUTREACH PROGRAM TO PROMOTE WOOD RESIDUE UTILIZATION FOR BIOENERGY IN WEST VIRGINIA**

**Research Team:** West Virginia University  
**Project PI:** Joseph McNeel  
**Agency:** University of Vermont  
**Project Total:** \$24,962  
**Submitted:** February 2007  
**Status:** Awarded  
**Award Date:** May 2007

### **USE OF WOOD BIOMASS TO MANUFACTURE LIQUID FUELS**

**Research Team:** West Virginia University  
**Project PI:** Ken Means, Joe McNeel  
**Agency:** WV EPSCoR  
**Project Total:** \$1,200,000  
**Submitted:** February 2007  
**Status:** Awarded  
**Award Date:** July 2007

### **WOOD INDUSTRY ASSISTANCE PROGRAM**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Forest Products Industry  
**Project PI:** Joseph McNeel, B. Gopalakrishnan  
**Agency:** West Virginia Development Office  
**Project Total:** \$80,000  
**Submitted:** July 2006  
**Status:** Awarded  
**Award Date:** October 2006

### **WOOD RESIDUE SURVEY 2007**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Joseph McNeel  
**Agency:** West Virginia Development Office  
**Project Total:** \$10,000  
**Submitted:** July 2006  
**Status:** Awarded  
**Award Date:** October 2006

### **DEVELOPMENT OF AN EXPERT SYSTEM TO ASSESS THE OPPORTUNITIES TO USE WOOD RESIDUE AS A COMMERCIAL AND INDUSTRIAL FUEL SOURCE IN THE APPALACHIAN REGION**

**Research Team:** West Virginia University, WVU Appalachian Hardwood Center, Cytec Industries  
**Project PI:** Ken Means, Shawn Grushecky  
**Agency:** USDA Forest Service  
**Project Total:** \$65,261  
**Submitted:** June 2006  
**Status:** Awarded  
**Award Date:** June 2006

### **DEVELOPMENT OF A DYNAMIC BUSINESS ANALYSIS MODEL TO PROMOTE THE PRODUCTION AND UTILIZATION OF BIO-BASED MATERIALS FOR BIOENERGY AND BIOPRODUCTS IN WEST VIRGINIA**

**Research Team:** West Virginia University  
**Project PI:** Joseph McNeel  
**Agency:** West Virginia Higher Education Policy Commission  
**Project Total:** \$48,205  
**Submitted:** February 2006  
**Status:** Awarded  
**Award Date:** July 2006

### **WEST VIRGINIA FOREST STEWARDSHIP PROGRAM**

**Research Team:** West Virginia University, West Virginia Forest Service  
**Project PI:** Joseph McNeel  
**Agency:** West Virginia Forest Service  
**Project Total:** \$45,005  
**Submitted:** February 2006  
**Status:** Awarded  
**Award Date:** July 2006

### **DEVELOPMENT OF A BIO-BASED MATERIALS CENTER**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Joseph McNeel  
**Agency:** West Virginia Development Office  
**Project Total:** \$75,000  
**Submitted:** July 2005  
**Status:** Awarded  
**Award Date:** October 2005

### **WOOD RESIDUE SURVEY 2006**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Joseph McNeel  
**Agency:** West Virginia Development Office  
**Project Total:** \$10,000  
**Submitted:** July 2005  
**Status:** Awarded  
**Award Date:** October 2005

### **APPALACHIAN HARDWOOD RESIDUE AS A SUPERIOR FIBER SOURCE FOR WOOD- POLYMER COMPOSITES**

**Research Team:** West Virginia University  
**Project PI:** Bill Johnson, Rakesh Gupta  
**Agency:** WVU Appalachian Hardwood Center  
**Project Total:** \$39,538  
**Submitted:** Febraury 2005  
**Status:** Not funded

### **SUSTAINABLE HARDWOOD FOREST MANAGEMENT FOR BIO-ENERGY: ECOLOGICAL AND ECONOMIC EFFECTS OF INCREASING LEVELS OF RESIDUE HARVESTING**

**Research Team:** West Virginia University, Mead Westvaco Company, USDA Forest Service, Northeast Experiment Station  
**Project PI:** Kathryn Piatek  
**Agency:** U.S. Department of Agriculture Agenda 2020  
**Agency Request:** \$400,000  
**Cost Share:** \$100,000  
**Project Total:** \$500,000  
**Submitted:** Febraury 2005  
**Status:** Not funded

## **TECHNOLOGIES AND PROCESSES FOR DURABLE HIGH STRENGTH WOOD-POLYMER COMPOSITES**

**Research Team:** West Virginia University, Crompton Corporation, Clariant Company, Michigan Tech, Oak Ridge National Laboratory

**Project PI:** Ben Dawson- Andoh  
**Agency:** WVU Research Corporation Program to Stimulate Competitive Research (PSCoR)

**Project Total:** \$46,520  
**Submitted:** January 2005  
**Status:** Awarded

## **EVALUATION OF ACCELERATED NATURAL EVEN- AGED IMMATURE BLACK CHERRY STRANDS**

**Research Team:** West Virginia University, Forecon (Timber Investment Company), Maryland State Forest and Park Service, Mead Westvaco, Western Pocahontas Land Co.

**Project PI:** John Brooks  
**Agency:** U.S. Department of Agriculture Agenda 2020

**Project Total:** \$150,000  
**Submitted:** October 2004  
**Status:** Not funded

## **THE IMPORTANCE OF LOGGING RESIDUES FOR FOREST PRODUCTIVITY**

**Research Team:** West Virginia University, US Forest Service Soils, Mead Westvaco

**Project PI:** Kathryn Piatek  
**Agency:** U.S. Department of Agriculture Agenda 2020

**Agency Request:** \$100,000  
**Cost Share:** \$ 20,000  
**Project Total:** \$120,000  
**Submitted:** October 2004  
**Status:** Not funded

## **WOOD INDUSTRY ASSISTANCE PROGRAM**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Forest Products Industry

**Project PI:** Joseph McNeel, B. Gopalakrishnan  
**Agency:** West Virginia Development Office

**Project Total:** \$80,000  
**Submitted:** July 2004  
**Status:** Awarded  
**Award Date:** October 2004

## **WOOD RESIDUE SURVEY 2005**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Joseph McNeel  
**Agency:** West Virginia Development Office  
**Project Total:** \$10,000  
**Submitted:** July 2004  
**Status:** Awarded  
**Award Date:** October 2004

## **WASTE REDUCTION AND VALUE ADDED PRODUCTION IN FOREST PRODUCT INDUSTRY**

**Research Team:** West Virginia University  
**Project PI:** Joseph McNeel  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$900,000  
**Cost Share:** \$ 90,000  
**Project Total:** \$990,000  
**Submitted:** May 2004  
**Status:** Not funded

## **CONDITION ASSESSMENT OF LOGS USING GROUND PENETRATING RADAR (GPR)**

**Research Team:** West Virginia University, West Virginia Development Office, Allegheny Wood Products, Taz Hardwoods, Inc.  
**Project PI:** Udaya Halabe, Bruce Anderson  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$750,000  
**Cost Share:** \$150,000  
**Project Total:** \$900,000  
**Submitted:** May 2004  
**Status:** Not funded

## **CONVERSION OF WOOD FIBER AND WOOD WASTE MATERIALS TO ACTIVATED CARBON MONOLITHS BY CHEMICAL ACTIVATION**

**Research Team:** West Virginia University, Oak Ridge National Laboratory, BOC Gases, 5R Processors LTD, Weyerhaeuser, Railway Tie Association, Premium Carbon LLC, Burke-Parsons-Bowlby Corporation, Products & Process Chemistry Consulting LLC, Wood Products Manufacturers Association, NorPro, Synfil Technologies, Energy Industries of Ohio, C3 International LLC, Georgia-Pacific  
**Project PI:** Ben Dawson- Andoh  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$1,500,000  
**Cost Share:** \$ 639,600  
**Project Total:** \$2,139,600  
**Submitted:** April 2004  
**Status:** Awarded at a lower funding level  
**Award Date:** August 2004

### **BTU'S FROM THE FOREST: EDUCATION CONFERENCE OF USE OF WOOD FIBER AS AN ENERGY SOURCE**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Shawn Grushecky  
**Agency:** West Virginia Development Office  
**Project Total:** \$25,760  
**Submitted:** January 2004  
**Status:** Awarded  
**Award Date:** July 2004

### **ECONOMIC AND ENVIRONMENTALLY SUSTAINABLE RECOVERY OF APPALACHIAN HARDWOOD BIOMASS (PRE-PROPOSAL)**

**Research Team:** West Virginia University, USDA Forest Service, The Weyerhaeuser Corporation, Timberjack Corporation, MeadWestvaco Corporation  
**Project PI:** Bill Johnson  
**Agency:** U.S. Department of Agriculture  
**Submitted:** January 2004  
**Status:** Not accepted for full proposal

### **ENERGY EFFICIENCY 2004: WOOD RESIDUE, WORKING GROUP & CONSTRUCTION**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Joseph McNeel  
**Agency:** West Virginia Development Office  
**Project Total:** \$60,000  
**Submitted:** June 2003  
**Status:** Awarded  
**Award Date:** October 2003

### **CENTER FOR THE DEVELOPMENT OF ADVANCED TECHNOLOGIES FOR THE HARDWOOD INDUSTRY**

**Research Team:** West Virginia University, Michigan Tech, Michigan State  
**Project PI:** Ben Dawson- Andoh  
**Agency:** West Virginia University  
**Project Total:** \$141,500  
**Submitted:** March 2003  
**Status:** Not funded

### **ASSESSING NON-TRADITIONAL VALUE-ADDED OPPORTUNITIES FOR PRIMARY PROCESSORS OF HARDWOOD LUMBER**

**Research Team:** West Virginia University, USDA Forest Service  
**Project PI:** Joseph McNeel  
**Agency:** USDA Forest Service  
**Project Total:** \$29,537  
**Submitted:** January 2003  
**Status:** Awarded  
**Award Date:** June 2003

### **WOOD IN TRANSPORTATION INFORMATION SYSTEM IMPROVEMENT**

**Research Team:** West Virginia University, USDA Forest Service  
**Project PI:** Bonnie Morris  
**Agency:** USDA Forest Service  
**Project Total:** \$25,930  
**Submitted:** January 2003  
**Status:** Awarded  
**Award Date:** March 2003

### **ASSESSING URBAN WOOD WASTE AND IT'S USES IN FIVE NORTHEASTERN CITIES (PRE-PROPOSAL)**

**Research Team:** West Virginia University, Davey Tree Service, USDA Northeast Research Station  
**Project PI:** Joseph McNeel  
**Agency:** U.S. Department of Agriculture Agenda 2020  
**Agency Request:** \$100,000  
**Cost Share:** \$ 20,000  
**Project Total:** \$120,000  
**Submitted:** October 2002  
**Status:** Not accepted for full proposal

### **DEVELOP RAPID, COST-AFFECTIVE METHODS FOR MEASURING WOOD PROPERTIES THAT AFFECT END-USERS (PRE-PROPOSAL)**

**Research Team:** Mead Westvaco Corporation, Weyerhaeuser OSB Plant  
**Project PI:** Philip H. Dunham  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$149,970  
**Cost Share:** \$ 17,970  
**Project Total:** \$167,940  
**Submitted:** October 2002  
**Status:** Not accepted for full proposal

### **REMOTE SENSING OF COARSE WOODY DEBRIS- FACILITATING WOOD RESIDUE ASSESSMENT FOR MARKETING, CARBON MODELING AND FIRE PREVENTION PURPOSES (PRE-PROPOSAL)**

**Research Team:** West Virginia University, Mead Westvaco Company, USDA Forest Service  
**Project PI:** David W. McGill  
**Agency:** U.S. Department of Agriculture Agenda 2020  
**Agency Request:** \$100,000  
**Cost Share:** \$ 20,000  
**Project Total:** \$120,000  
**Submitted:** October 2002  
**Status:** Not accepted for full proposal

## **WOOD FORMATION AND WOOD QUALITY- DEVELOP RAPID, COST-EFFECTIVE METHODS FOR MEASURING WOOD PROPERTIES THAT AFFECT END-USERS (PRE-PROPOSAL)**

**Research Team:** West Virginia University, Mead Westvaco Corporation, Weyerhaeuser Corporation  
**Project PI:** Ben Dawson- Andoh  
**Agency:** U.S. Department of Agriculture Agenda 2020  
**Agency Request:** \$149,970  
**Cost Share:** \$ 29,994  
**Project Total:** \$179,964  
**Submitted:** October 2002  
**Status:** Not accepted for full proposal

## **BORATE PALLET TREATMENT AND WEB BASED WOOD RESIDUE**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Joseph McNeel  
**Agency:** West Virginia Development Office  
**Project Total:** \$65,000  
**Submitted:** July 2002  
**Status:** Awarded  
**Award Date:** October 2002

## **WOOD INDUSTRY ASSISTANCE PROGRAM**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Forest Products Industry  
**Project PI:** Joseph McNeel, B. Gopalakrishnan  
**Agency:** West Virginia Development Office  
**Project Total:** \$80,000  
**Submitted:** July 2002  
**Status:** Awarded  
**Award Date:** October 2002

## **CONDITION ASSESSMENT OF LOGS USING GROUND PENETRATING RADAR**

**Research Team:** West Virginia University, Allegheny Wood Products, Taz Hardwoods, Inc., Burke-Parsons-Bowlby Corporation, Jim C. Hamer Lumber Company, B.A. Mullican Lumber and Manufacturing Company  
**Project PI:** Udaya Halabe, Bruce Anderson  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$522,509  
**Cost Share:** \$177,430  
**Project Total:** \$699,939  
**Submitted:** April 2002  
**Status:** Not funded

## **CONDITION ASSESSMENT OF LOGS USING GROUND PENETRATING RADAR**

**Research Team:** West Virginia University Morgantown, WV  
Allegheny Wood Products Petersburg, WV  
Taz Hardwoods, Inc., Burke-Parsons-Bowlby Corporation, Jim C. Hamer Lumber Company

**Project PI:** Udaya Halabe, Bruce Anderson  
**Agency:** U.S. Department of Energy

**Agency Request:** \$ 849,995  
**Cost Share:** \$ 308,905  
**Project Total:** \$1,158,900

**Submitted:** July 2001  
**Status:** Not funded

## **CREATING VALUE-ADDED PRODUCTS FROM WOOD RESIDUES**

**Research Team:** West Virginia University, Auburn Machinery, Inc., BalkenTier Consulting

**Project PI:** Joseph McNeel  
**Agency:** U.S. Department of Energy

**Agency Request:** \$440,616  
**Cost Share:** \$155,249  
**Project Total:** \$595,865

**Submitted:** July 2001  
**Status:** Not funded

## **FOREST PRODUCTS INDUSTRIES OF THE FUTURE ACTIVITIES**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Forest Products Industry

**Project PI:** Joseph McNeel, B. Gopalakrishnan  
**Agency:** West Virginia Development Office

**Project Total:** \$30,000  
**Submitted:** June 2001  
**Status:** Awarded  
**Award Date:** October 2001

## **ADDING VALUE TO WOOD RESIDUES**

**Research Team:** West Virginia University, West Virginia Development Office

**Project PI:** Joseph McNeel  
**Agency:** U.S. Department of Energy

**Agency Request:** \$900,000  
**Cost Share:** \$ 90,000  
**Project Total:** \$990,000

**Submitted:** May 2001  
**Status:** Accepted for full proposal submission

**ASSESSING HARDWOOD HARVESTING SYSTEMS FOR ENERGY EFFICIENCY, SITE IMPACT, COST AND PRODUCTIVITY (PRE-PROPOSAL)**

**Research Team:** West Virginia University, West Virginia Development Office, WVU Appalachian Hardwood Center  
**Project PI:** Joseph McNeel, Jeff Herholdt  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$297,500  
**Cost Share:** \$127,500  
**Project Total:** \$425,000  
**Submitted:** May 2001  
**Status:** Not accepted for full proposal

**CONDITION ASSESSMENT OF LOGS USING GROUND PENETRATING RADAR (PRE-PROPOSAL)**

**Research Team:** West Virginia University, Allegheny Wood Products, Taz Hardwoods, Inc.  
**Project PI:** Udaya Halabe, Bruce Anderson  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$750,000  
**Cost Share:** \$150,000  
**Project Total:** \$900,000  
**Submitted:** May 2001  
**Status:** Accepted for full proposal submission

**DEVELOPMENT OF TECHNOLOGY FOR DIRECT, ON-SITE CONVERSION OF SAWMILL RESIDUE AND POULTRY LITTER TO LIQUID FUELS AND CHEMICALS ON-SITE (PRE-PROPOSAL)**

**Research Team:** West Virginia Development Office, West Virginia University, Allegheny Wood Products, Taz Hardwoods, Inc., Northoc, Inc. West Virginia Department of Agriculture  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$521,000  
**Cost Share:** \$130,275  
**Project Total:** \$651,275  
**Submitted:** May 2001  
**Status:** Accepted for full proposal submission

**INVESTIGATE, DEVELOP AND PROMOTE NEW TECHNOLOGY AND MARKETS FOR UTILIZING LOW-VALUE, LOW-GRADE HARDWOOD PRODUCTS**

**Research Team:** West Virginia University, Appalachian Hardwood Center  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$350,000  
**Cost Share:** \$ 35,000  
**Project Total:** \$385,000  
**Submitted:** May 2001  
**Status:** Not accepted for full proposal

**INVESTIGATE, DEVELOP AND PROMOTE NEW TECHNOLOGY AND MARKETS FOR UTILIZING LOW-VALUE, LOW-GRADE HARDWOOD PRODUCTS (PRE-PROPOSAL)**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Steve Milauskis, Joseph McNeel  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$350,000  
**Cost Share:** \$ 35,000  
**Project Total:** \$385,000  
**Submitted:** May 2001  
**Status:** Not accepted for full proposal

**RESEARCH INTO THE FEASIBILITY AND DESIGN OF BIOMASS WOOD FUEL SYSTEMS FOR USE IN ENERGY GENERATION**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Joseph McNeel  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$530,000  
**Cost Share:** \$130,000  
**Project Total:** \$660,000  
**Submitted:** May 2001  
**Status:** Not funded

**WILD LAND FIRES IN WEST VIRGINIA: A PLANNING APPROACH FOR MANAGEMENT AND CONTROL**

**Research Team:** West Virginia University, USDA Forest Service  
**Project PI:** Shawn Grushecky  
**Agency:** USDA Forest Service  
**Project Total:** \$64,240  
**Submitted:** March 2001  
**Status:** Awarded  
**Award Date:** September 2001

**ENHANCING WEST VIRGINIA'S FOREST STEWARDSHIP PROGRAM THROUGH WEB-BASED OUTREACH AND DEMONSTRATION PROJECTS**

**Research Team:** West Virginia University, USDA Forest Service  
**Project PI:** Joseph McNeel  
**Agency:** USDA Forest Service  
**Project Total:** \$35,000  
**Submitted:** November 2000  
**Status:** Awarded  
**Award Date:** March 2001

### **WOOD INDUSTRY ASSISTANCE PROGRAM**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Forestry Products Industry  
**Project PI:** Joseph McNeel, B. Gopalakrishnan  
**Agency:** West Virginia Development Office  
**Project Total:** \$70,000  
**Submitted:** July 2000  
**Status:** Awarded  
**Award Date:** October 2000

### **SUSTAINABLE FORESTRY INITIATIVE**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Joseph McNeel  
**Agency:** West Virginia Development Office  
**Project Total:** \$50,000  
**Submitted:** June 2000  
**Status:** Awarded  
**Award Date:** October 2000

### **DESIGN OF THINNER CIRCULAR SAW BLADES FOR FOREST PRODUCTS APPLICATIONS**

**Research Team:** West Virginia University, Oak Ridge National Laboratory  
**Project PI:** Larry Banta  
**Agency:** U.S. Department of Energy  
**Project Total:** \$40,000  
**Submitted:** January 2000  
**Status:** Awarded  
**Award Date:** May 1999

### **WOOD INDUSTRY ASSISTANCE PROGRAM**

**Research Team:** West Virginia University Morgantown, West Virginia Development Office, West Virginia Forestry Products Industry  
**Project PI:** Joseph McNeel, B. Gopalakrishnan  
**Agency:** West Virginia Development Office  
**Project Total:** \$35,000  
**Submitted:** October 1999  
**Status:** Awarded  
**Award Date:** March 2000

### **PROMOTION OF BIOMASS ENERGY IN WEST VIRGINIA**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Curt Hassler  
**Agency:** West Virginia Development Office  
**Project Total:** \$20,000  
**Submitted:** June 1999  
**Status:** Awarded  
**Award Date:** August 1999

### **ANALYSIS OF VENEER QUALITY LOG ATTRIBUTES**

**Research Team:** West Virginia University, USDA Forest Service  
**Project PI:** Bruce Anderson  
**Agency:** USDA Forest Service  
**Project Total:** \$26,941  
**Submitted:** January 1999  
**Status:** Awarded  
**Award Date:** May 1999

### **IMPROVING WOOD IN TRANSPORTATION PROGRAM TECHNOLOGY TRANSFER NEEDS**

**Research Team:** West Virginia University, USDA Forest Service  
**Project PI:** Bonnie Morris  
**Agency:** USDA Forest Service  
**Project Total:** \$29,604  
**Submitted:** January 1999  
**Status:** Awarded  
**Award Date:** August 1999

### **WOOD INDUSTRY ASSISTANCE PROGRAM**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Forest Products Industry  
**Project PI:** Curt Hassler  
**Agency:** West Virginia Development Office  
**Project Total:** \$30,000  
**Submitted:** October 1998  
**Status:** Awarded  
**Award Date:** January 1999

### **EVALUATION OF MULTI-PRODUCT INTERACTION FOR SOUTHERN APPALACHIAN HARDWOOD STANDS**

**Research Team:** West Virginia University, USDA Forest Service  
**Project PI:** B. Gopalakrishnan  
**Agency:** USDA Forest Service  
**Project Total:** \$10,000  
**Submitted:** January 1998  
**Status:** Awarded  
**Award Date:** July 1998

## Mining

### **DESIGN, DEVELOPMENT, AND DEMONSTRATION OF A SURGE CAR FOR ENERGY-EFFICIENT UNDERGROUND CONTINUOUS MINING OPERATIONS**

**Research Team:** West Virginia University, WV Development Office, Phillips Machine Service, Alpha Natural Resources, Consol Energy, Peabody Energy, Turriss Coal Company, Illinois Clean Coal Institute, Southern Illinois University at Carbondale

**Project PI:** Bill Johnson  
**Agency:** U.S. Department of Energy

**Agency Request:** \$1,898,475  
**Cost Share:** \$1,614,908  
**Project Total:** \$3,513,383  
**Submitted:** June 2004  
**Status:** Not funded

### **DEMONSTRATION OF CROSSWELL IMAGING TECHNOLOGY AND ADVANCED DRILLSTRING RADAR NAVIGATION FOR HORIZONTAL DIRECTIONAL DRILLING**

**Research Team:** West Virginia University, Stolar Research Corp., CONSOL, Inc., Kennecott Exploration, Sandia National Laboratory

**Project PI:** Syd Peng  
**Agency:** U.S. Department of Energy

**Agency Request:** \$ 750,000  
**Cost Share:** \$ 750,000  
**Project Total:** \$1,500,000  
**Submitted:** May 2003  
**Status:** Awarded  
**Award Date:** January 2004

### **DEMONSTRATION OF THE JUSTICE ULTRA-THIN SEAM MINING SYSTEM WITH OPTIMIZED CUTTER HEAD DESIGN**

**Research Team:** West Virginia University, COALTEX/Bluestone Industries, Inc., WV Development Office, Joy Mining Machinery, The Ohio Valley Coal Company, WVU Mining Extension Program, Industries of the Future – West Virginia

**Project PI:** A. Wahab Khair  
**Agency:** U.S. Department of Energy

**Agency Request:** \$ 652,314  
**Cost Share:** \$ 652,314  
**Project Total:** \$1,304,628  
**Submitted:** May 2003  
**Status:** Not funded

### **DEMONSTRATION OF THE JUSTICE ULTRA-THIN SEAM MINING SYSTEM**

**Research Team:** COALTEX/Bluestone Industries, Inc., Bluestone Industries, WV Development Office, West Virginia University

**Project PI:** A. Wahab Khair

**Agency:** U.S. Department of Energy

**Agency Request:** \$ 525,000

**Cost Share:** \$ 505,582

**Project Total:** \$1,030,582

**Submitted:** June 2002

**Status:** Not funded

### **DEVELOP AND DEMONSTRATE A LABORATORY MODEL OF AN EFFICIENT CUTTING COAL/ROCK DRUM FOR CONTINUOUS MINER (PRE-PROPOSAL)**

**Research Team:** West Virginia University, West Virginia Development Office, Ohio Valley Coal Company, Kennametal Mining Products Co., Joy Mining Equipment Manufacturing Co.

**Project PI:** A. Wahabkhair

**Agency:** U.S. Department of Energy

**Agency Request:** \$150,000

**Cost Share:** \$ 10,000

**Project Total:** \$160,000

**Submitted:** May 2001

**Status:** Accepted for full proposal submission

### **STUDIES OF LONGWALL SUBSIDENCE DISTURBANCE TO SURFACE WATER BODIES**

**Research Team:** West Virginia University, Consolidation Coal Company, Blacksville No. 2 Mine, Eastern Association Coal, Federal No. 2 Mine

**Project PI:** Jeff Herholdt

**Agency:** U.S. Department of Energy

**Agency Request:** \$605,240

**Cost Share:** \$145,000

**Project Total:** \$750,240

**Submitted:** May 2001

**Status:** Accepted for full proposal submission

### **TYPIFICATION OF GOB GAS EMISSIONS FROM ABANDONED COAL MINE WORKINGS (PRE-PROPOSAL)**

**Research Team:** West Virginia University, West Virginia Development Office

**Project PI:** Lloyd M. English

**Agency:** U.S. Department of Energy

**Agency Request:** \$440,000

**Cost Share:** \$ 61,000

**Project Total:** \$501,000

**Submitted:** May 2001

**Status:** Accepted for full proposal submission

### **DEVELOP AND DEMONSTRATE AN EFFICIENT CONTINUOUS MINER DRUM**

**Research Team:** West Virginia University, Kennametal Inc., The Ohio Valley Coal Company, Joy Mining Machinery  
**Project PI:** A. Wahab Khair  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$540,033  
**Cost Share:** \$303,188  
**Project Total:** \$843,221  
**Submitted:** July 2001  
**Status:** Not funded

### **STUDIES OF LONGWALL SUBSIDENCE DISTURBANCE TO SURFACE WATER BODIES**

**Research Team:** West Virginia University, RAG American Coal Company  
**Project PI:** Syd Peng  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$461,130  
**Cost Share:** \$223,782  
**Project Total:** \$684,912  
**Submitted:** July 2001  
**Status:** Not funded

### **EVALUATION OF ROOF BOLTING REQUIREMENTS BASED ON IN-MINE ROOF BOLTER DRILLING PARAMETERS**

**Research Team:** West Virginia University, CONSOL Inc., Commercial Stone Company Inc., The Ohio Valley Coal Company, J.H. Fletcher & Co., Newmont Mining Company, Riverton Coal Production Inc.  
**Project PI:** Syd Peng  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$1,352,341  
**Cost Share:** \$ 172,640  
**Project Total:** \$1,524,981  
**Submitted:** April 2000  
**Status:** Awarded  
**Award Date:** December 2000

### **IN-MINE VALIDATION OF METHOD DETERMINING CHARACTERISTICS OF COAL SEAM USING ELECTROMAGNETIC TRANSMISSION**

**Research Team:** West Virginia University  
**Project PI:** Syd Peng  
**Agency:** U.S. Department of Energy  
**Project Total:** \$40,304  
**Submitted:** November 1999  
**Status:** Awarded  
**Award Date:** May 2000

## **Crosscut**

### **DEVELOPMENT AND ENHANCEMENT OF GEPDSS – GALVANIZING ENERGY PROFILER AND DECISION SUPPORT SYSTEM**

**Research Team:** West Virginia University, International Lead Zinc Research Organization  
**Project PI:** B. Gopalakrishnan  
**Agency:** International Lead Zinc Research Organization  
**Project Total:** \$60,000  
**Submitted:** January 2008  
**Status:** Pending

### **INTERDISCIPLINARY PROGRAM TO EVALUATE TOXICITY OF EMERGING MATERIALS AND ENERGY SOURCES**

**Research Team:** West Virginia University, West Virginia University School of Medicine  
**Project PI:** Rakesh Gupta  
**Agency:** WVU Program to Stimulate Interdisciplinary Research (PSIR)  
**Project Total:** \$250,000  
**Submitted:** December 2007  
**Status:** Pending

### **WEST VIRGINIA SAVE ENERGY NOW ASSESSMENT/IMPLEMENTATION PROGRAM**

**Research Team:** West Virginia University, West Virginia Division of Energy  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Project Total:** \$50,000  
**Submitted:** November 2007  
**Status:** Awarded  
**Award Date:** January 2008

### **ASSESSMENT OF HUMAN EXPOSURE TO AIRBORNE ENGINEERED NANOPARTICLES**

**Research Team:** West Virginia University; University of Delaware; University of North Dakota  
**Project PI:** Ed Crowe  
**Agency:** U.S. Environmental Protection Agency  
**Agency Request:** \$399,181  
**Cost Share:** \$ 21,576  
**Project Total:** \$420,757  
**Submitted:** August 2007  
**Status:** Not funded

## **EFFICIENT CONCENTRATION OF SUNLIGHT USING CONFORMABLE SELF-CLEANING THIN SOLAR REFLECTORS**

**Research Team:** West Virginia University, CP Films, 3M, Concentrating Solar Technologies  
**Project PI:** Darran Cairns  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$2,173,982  
**Cost Share:** \$1,401,100  
**Project Total:** \$3,575,082  
**Submitted:** August 2007  
**Status:** Not funded

## **PARTNERSHIP APPROACH TO INCREASE ENERGY EFFICIENCY AND ENVIRONMENTAL SUSTAINABILITY IN INDIA'S STEEL INDUSTRY**

**Research Team:** West Virginia University, George Staats, Consultant, Indira Gandhi Institute of Development Research, ILZRO, University of Hyderabad, Metallics, Duraloy, Praxair, Maharashtra Energy Development Agency, India National Productivity Council, U.S. Foreign Commercial Service - Hyderabad Office, Mazak  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of State  
**Agency Request:** \$1,018,099  
**Cost Share:** \$1,020,738  
**Project Total:** \$2,038,837  
**Submitted:** July 2007  
**Status:** Not funded

## **NOVEL SURFACE MODIFICATION AND PROCESS CHARACTERIZATION FOR DEVELOPING SUSTAINABLE, HIGH-PERFORMANCE COMPOSITES DERIVED FROM BIOMASS (PRE-PROPOSAL)**

**Research Team:** West Virginia University, Oak Ridge National Laboratory  
**Project PI:** Ed Crowe  
**Agency:** U.S. Department of Agriculture  
**Agency Request:** \$659,025  
**Cost Share:** \$134,508  
**Project Total:** \$793,533  
**Submitted:** July 2007  
**Status:** Not accepted for full proposal

## **SURFACE MODIFICATIONS OF BIOMASS (PRE-PROPOSAL)**

**Research Team:** West Virginia University, Oak Ridge National Laboratory  
**Project PI:** Ed Crowe  
**Agency:** U.S. Department of Agriculture  
**Agency Request:** \$524,517  
**Cost Share:** \$134,508  
**Project Total:** \$659,025  
**Submitted:** July 2007  
**Status:** Not funded

**PROPOSED WORKSHOP ENTITLED "VOLATILE ENERGY COSTS AND ENERGY INTENSIVE INDUSTRIES: IMPACTS AND COPING STRATEGIES"**

**Research Team:** West Virginia University  
**Project PI:** Carl Irwin, Jack Fuller  
**Agency:** Alfred P. Sloan Foundation  
**Project Total:** \$38,336  
**Submitted:** June 2007  
**Status:** Awarded at a lower funding level

**NOVEL SURFACE MODIFICATION AND PROCESS CHARACTERIZATION FOR DEVELOPING SUSTAINABLE, HIGH-PERFORMANCE COMPOSITES DERIVED FROM BIOMASS (PRE-PROPOSAL)**

**Research Team:** West Virginia University, Oak Ridge National Laboratory  
**Project PI:** Ed Crowe  
**Agency:** U.S. DOE EPSCoR  
**Project Total:** \$450,000  
**Submitted:** May 2007  
**Status:** Not accepted for full proposal

**PARTNERSHIP APPROACH TO INCREASE ENERGY EFFICIENCY AND ENVIRONMENTAL SUSTAINABILITY IN INDIA'S STEEL INDUSTRY (PRE-PROPOSAL)**

**Research Team:** American Iron and Steel Institute (AISI); Oak Ridge national Laboratory (ORNL); South East Center for Aluminum Technology (SECAT); Metallics Inc. (USA); U.S. DOE Industrial Technologies Program (ITP); National Aluminum Company of India (NALCO); Indira Gandhi Institute of Development Research (India); Maharashtra Economic Development Council (India); Vizag Steel Plant (India)  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of State  
**Agency Request:** \$1,296,653  
**Cost Share:** \$1,554,312  
**Project Total:** \$2,850,965  
**Submitted:** April 2007  
**Status:** Accepted for full proposal submission

**WASTE HEAT ENERGY PROJECT AT GLOBE METALLURGICAL**

**Research Team:** West Virginia University, Recycled Energy Development  
**Project PI:** Carl Irwin  
**Agency:** Recycled Energy Development  
**Project Total:** \$5,500  
**Submitted:** March 2007  
**Status:** Awarded  
**Award Date:** April 2007

## **THE WVU CENTER FOR MATERIAL INDUSTRIES INNOVATION PARTNERSHIPS**

**Research Team:** West Virginia University  
**Project PI:** Carl Irwin  
**Agency:** WVU Program to Stimulate Interdisciplinary Research (PSIR)  
**Agency Request:** \$149,409  
**Cost Share:** \$162,510  
**Project Total:** \$311,919  
**Submitted:** December 2006  
**Status:** Not funded

## **PARTNERSHIPS FOR INNOVATION - WEST VIRGINIA**

**Research Team:** West Virginia University, WVU Office of Technology Transfer, the WVU Entrepreneurship Center, the WV Development Office, the WV Manufacturers Association, Mountaineer Capital LP, the National Energy Technology Laboratory, the Robert C. Byrd Institute for Advanced Flexible Manufacturing, the WV High Technology Foundation's INNOVA program, the WV Small Business Development Center, and the Chemical Alliance Zone of South Charleston, WV  
**Project PI:** Carl Irwin  
**Agency:** National Science Foundation  
**Agency Request:** \$600,000  
**Cost Share:** \$ 64,521  
**Project Total:** \$664,521  
**Submitted:** August 2006  
**Status:** Not funded

## **PREPARATION, CHARACTERIZATION, QUALITY CONTROL AND TRANSPORT PROPERTIES OF NANOFUIDS FOR OIL AND GAS DEEP HOLE DRILLING**

**Research Team:** West Virginia University, Carnegie Mellon University, U.S. DOE National Energy Technology Laboratory  
**Project PI:** Rakesh Gupta  
**Agency:** U.S. Department of Energy NETL RDS  
**Agency Request:** \$703,894  
**Cost Share:** \$ 64,800  
**Project Total:** \$768,694  
**Submitted:** July 2006  
**Status:** Awarded  
**Award Date:** October 2006

## **DEVELOPMENT OF NEXT GENERATION NANO-STRUCTURED ALLOYS FOR COAL-FIRED ULTRASUPERCRITICAL STEAM POWER SYSTEMS**

**Research Team:** West Virginia University, North Carolina State University, University of Cincinnati, University of Tennessee, Special Metals Corporation, Siemens Power Generation Inc.

**Project PI:** Xingbo Liu

**Agency:** U.S. Department of Energy

**Agency Request:** \$ 936,853

**Cost Share:** \$ 439,397

**Project Total:** \$1,376,250

**Submitted:** June 2006

**Status:** Not funded

## **PLASTIC LUMBER MANUFACTURED FROM RECYCLED ABS & WOOD FLOUR FOR INDOOR CONSTRUCTION APPLICATIONS**

**Research Team:** West Virginia University, Star Plastics

**Project PI:** Mel Croucher

**Agency:** National Science Foundation SBIR/STTR

**Project Total:** \$99,970

**Submitted:** June 2006

**Status:** Not funded

## **ENERGY ASSESSMENTS FOR WEST VIRGINIA INDUSTRIES OF THE FUTURE (IOF)**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry

**Project PI:** B. Gopalakrishnan

**Agency:** West Virginia Development Office

**Project Total:** \$75,000

**Submitted:** October 2006

**Status:** Awarded

**Award Date:** January 2007

## **FATIGUE CRACKING OF NI-BASED SUPERALLOYS - EFFECTS OF MICROSTRUCTURES AND ENVIRONMENT**

**Research Team:** West Virginia University

**Project PI:** Xingbo Liu

**Agency:** U.S. Department of Defense EPSCoR (AFOSR)

**Agency Request:** \$546,654

**Cost Share:** \$ 36,000

**Project Total:** \$582,654

**Submitted:** October 2006

**Status:** Not funded

## **PROJECTS WITH INDUSTRY**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Ken Means  
**Agency:** West Virginia Development Office  
**Project Total:** \$150,000  
**Submitted:** June 2006  
**Status:** Awarded  
**Award Date:** October 2006

## **DEGREDDATION OF METALLIC INTERCONNECTS IN COAL-BASED SOFC**

**Research Team:** West Virginia University, University of Pittsburgh, U.S. DOE National Energy Technology Laboratory  
**Project PI:** Xingbo Liu  
**Agency:** U.S. Department of Energy NETL RDS  
**Project Total:** \$160,000  
**Submitted:** March 2006  
**Status:** Awarded  
**Award Date:** August 2006

## **INDUSTRIAL ASSESSMENT CENTER**

**Research Team:** West Virginia University  
**Project PI:** B. Gopalakrishnan  
**Agency:** U.S. Department of Energy  
**Project Total:** \$192,354  
**Submitted:** March 2006  
**Status:** Awarded  
**Award Date:** September 2006

## **MODELS FOR ENERGY FUTURES AND NETL'S LOCAL/REGIONAL AND ENVIRONMENTAL IMPACT**

**Research Team:** West Virginia University, University of Pittsburgh, U.S. DOE National Energy Technology Laboratory  
**Project PI:** Mike Carr  
**Agency:** U.S. Department of Energy NETL RDS  
**Agency Request:** \$74,995  
**Cost Share:** \$ 5,250  
**Project Total:** \$80,245  
**Submitted:** March 2006  
**Status:** Awarded  
**Award Date:** August 2006

## **WEST VIRGINIA ADVANCED ENERGY MATERIALS CENTER**

**Research Team:** West Virginia University, U.S. DOE National Energy Technology Laboratory, Oak Ridge National Laboratory, Marshall University, West Virginia University Tech., West Virginia State College, Special Metals, GE Energy Systems, American Electric Power

**Project PI:** Xingbo Liu, Mike Carr

**Agency:** WV EPSCoR Research Group Initiation

**Project Total:** \$50,000

**Submitted:** March 2006

**Status:** Not funded

## **NANOTECHNOLOGY: A NOVEL APPROACH TO PREVENT BIOCIDES LEACHING**

**Research Team:** West Virginia University, Michigan Tech, Michigan State

**Project PI:** Ben Dawson- Andoh

**Agency:** Michigan Technological University

**Project Total:** \$66,804

**Submitted:** February 2006

**Status:** Awarded

**Award Date:** July 2006

## **BLAST RESISTANT COMPOSITE MATERIALS**

**Research Team:** West Virginia University

**Project PI:** Rakesh Gupta

**Agency:** Federal Highway Administration

**Project Total:** \$119,400

**Submitted:** December 2005

**Status:** Awarded

**Award Date:** May 2006

## **DEVELOPMENT OF AN ALLOY FOR NEXT GENERATION COAL-FIRED POWER SYSTEMS**

**Research Team:** West Virginia University

**Project PI:** Xingbo Liu

**Agency:** WVU Research Corporation Program to Stimulate Competitive Research (PSCoR)

**Agency Request:** \$39,000

**Cost Share:** \$ 5,000

**Project Total:** \$44,000

**Submitted:** December 2005

**Status:** Awarded

**Award Date:** July 2006

## **ENERGY ASSESSMENTS FOR WEST VIRGINIA INDUSTRIES OF THE FUTURE (IOF)**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** B. Gopalakrishnan  
**Agency:** West Virginia Development Office  
**Project Total:** \$75,000  
**Submitted:** October 2005  
**Status:** Awarded  
**Award Date:** January 2006

## **ON-FARM UTILIZATION OF POULTRY LITTER AS GASIFIER FEEDSTOCK FOR BROILER HOUSE HEATING**

**Research Team:** West Virginia University, Coaltec Energy  
**Project PI:** Bill Johnson  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$ 90,000  
**Cost Share:** \$ 70,000  
**Project Total:** \$160,000  
**Submitted:** September 2005  
**Status:** Not funded

## **DEVELOPMENT OF A MULTI-PURPOSE DYNAMIC IGCC MODEL FOR AN ENERGY-INTENSIVE INDUSTRY CLUSTER**

**Research Team:** West Virginia University, U.S. DOE National Energy Technology Laboratory  
**Project PI:** Richard Turton, Bill Johnson  
**Agency:** U.S. Department of Energy NETL RDS  
**Agency Request:** \$131,305  
**Cost Share:** \$ 32,127  
**Project Total:** \$163,432  
**Submitted:** July 2005  
**Status:** Awarded  
**Award Date:** September 2005

## **LOW-COST, RELIABLE ENERGY AND CHEMICAL FEEDSTOCKS FOR ENERGY-INTENSIVE INDUSTRY CLUSTERS: FEASIBILITY STUDY OF A COAL- FIRED CO - GENERATION FACILITY IN MARSHALL COUNTY WV.**

**Research Team:** West Virginia University  
**Project PI:** Bill Johnson, Richard Turton  
**Agency:** U.S. DOE NETL  
**Project Total:** \$50,000  
**Submitted:** July 2005  
**Status:** Awarded  
**Award Date:** September 2004

## **DEVELOPMENT OF A MULTI-PURPOSE ASPEN-BASED DYNAMIC IGCC MODEL FOR AN ENERGY-INTENSIVE INDUSTRY CLUSTER (PRE-PROPOSAL)**

**Research Team:** West Virginia University  
**Project PI:** Richard Turton  
**Agency:** U.S. Department of Energy NETL RDS  
**Project Total:** \$320,000  
**Submitted:** June 2005  
**Status:** accepted for full proposal submission  
**Award Date:** July 2005

## **WEST VIRGINIA CENTER FOR MATERIALS INNOVATION PARTNERSHIPS**

**Research Team:** West Virginia University, Crompton, Interstate Hardwoods Company, Inc., Marsh Bellofram, PPG Industries, Star Plastics, HK Casting, Inc., West Virginia Manufacturers Association, Benedum Foundation, American Iron & Steel Institute, Mountaineer Capital, LP, Chemical Alliance Zone, Wheeling-Nisshin, Steel of West Virginia, Dyna-Tech Adhesives, West Virginia Development Office  
**Project PI:** Carl Irwin  
**Agency:** National Science Foundation  
**Project Total:** \$600,000  
**Submitted:** June 2005  
**Status:** Not funded

## **CO-PRODUCTION OF BIOFUELS AND POROUS CARBON BIOCOKE**

**Research Team:** West Virginia University  
**Project PI:** Elliot Kennel  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$68,226  
**Cost Share:** \$31,384  
**Project Total:** \$99,610  
**Submitted:** May 2005  
**Status:** Not funded

## **OPTIMIZATION OF THE CONVERSION OF AGRICULTURAL WASTE TO FUEL**

**Research Team:** West Virginia University  
**Project PI:** Al Stiller  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$65,532  
**Cost Share:** \$22,729  
**Project Total:** \$88,261  
**Submitted:** May 2005  
**Status:** Not funded

### **STRATEGIC GROWTH OF THE MID-ATLANTIC CHP APPLICATION CENTER**

**Research Team:** Maryland Energy Administration, Mid-Atlantic CHP Application Center, University of Maryland, West Virginia University, Rutgers University

**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Submitted:** May 2005  
**Status:** Awarded

### **USE OF GREEN WOOD RESIDUES AS POULTRY BEDDING MATERIAL**

**Research Team:** West Virginia University, Seneca Rentals LLC

**Project PI:** Ben Dawson- Andoh  
**Agency:** U.S. Department of Energy

**Agency Request:** \$64,205  
**Cost Share:** \$24,934  
**Project Total:** \$89,139  
**Submitted:** May 2005  
**Status:** Not funded

### **DEVELOPING NOVEL COATING FOR SOFC INTERCONNECTS**

**Research Team:** West Virginia University, University of Pittsburgh, U.S. DOE National Energy Technology Laboratory

**Project PI:** Xingbo Liu  
**Agency:** U.S. Department of Energy NETL RDS

**Agency Request:** \$396,000  
**Cost Share:** \$150,000  
**Project Total:** \$546,000  
**Submitted:** March 2005  
**Status:** Awarded  
**Award Date:** September 2005

### **DEVELOP NANO-COATINGS FOR APPLICATIONS IN COAL-FIRED ENVIRONMENT**

**Research Team:** West Virginia University, Special Metals Company, Advanced Materials and Processes, Texas State University

**Project PI:** Xingbo Liu  
**Agency:** U.S. Department of Energy STTR

**Project Total:** \$32,861  
**Submitted:** December 2004  
**Status:** Not funded

**THE WVU CENTER FOR INDUSTRIAL TECHNOLOGY PARTNERSHIPS - DEVELOPING COMPETITIVE, EFFICIENT INDUSTRIES OF THE FUTURE**

**Research Team:** West Virginia University  
**Project PI:** Carl Irwin, Bill Johnson  
**Agency:** WVU Research Corporation FY 2006 PSIR  
**Project Total:** \$149,859  
**Submitted:** December 2004  
**Status:** Not funded

**UTILITY-SCALE PULP MILL-BASED BIO-REFINERY ECONOMICS**

**Research Team:** West Virginia University, Virginia Tech, Georgia Tech  
**Project PI:** Bill Johnson  
**Agency:** Georgia Tech  
**Agency Request:** \$231,844  
**Cost Share:** \$ 63,015  
**Project Total:** \$294,859  
**Submitted:** November 2004  
**Status:** Not funded

**ENERGY ASSESSMENTS FOR WEST VIRGINIA INDUSTRIES OF THE FUTURE OF (IOF)**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** B. Gopalakrishnan  
**Agency:** West Virginia Development Office  
**Project Total:** \$75,000  
**Submitted:** October 2004  
**Status:** Awarded  
**Award Date:** January 2005

**INDUSTRIAL NATURAL GAS UTILIZATION CENTER**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Bill Johnson  
**Agency:** West Virginia Development Office  
**Project Total:** \$100,000  
**Submitted:** August 2004  
**Status:** Awarded  
**Award Date:** October 2004

**ENERGY POLICY CONSIDERATIONS FOR ENERGY-INTENSIVE INDUSTRIES (PRE-PROPOSAL)**

**Research Team:** West Virginia University  
**Project PI:** Bill Johnson  
**Agency:** U.S. Department of Energy  
**Project Total:** \$50,000  
**Submitted:** June 2004  
**Status:** Accepted for full proposal submission

## **PROJECTS WITH INDUSTRY**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Ken Means  
**Agency:** West Virginia Development Office  
**Project Total:** \$120,000  
**Submitted:** June 2004  
**Status:** Awarded  
**Award Date:** October 2004

## **ADAPTIVE BIOREFINERY PLATFORMS**

**Research Team:** West Virginia University, Institute of Pulp and Paper, Georgia Tech. University, Virginia Tech, University  
**Project PI:** Ben Dawson- Andoh, Richard Turton, Bill Johnson  
**Agency:** U.S. Department of Energy Biomass Program  
**Agency Request:** \$295,000  
**Cost Share:** \$ 63,000  
**Project Total:** \$358,000  
**Submitted:** September 2004  
**Status:** Not funded

## **PREVENTING SOLIDIFICATION DEFECTS IN LARGE SUPERALLOY CASTINGS USED IN ADVANCED ELECTRIC POWER SYSTEMS**

**Research Team:** West Virginia University, Penn State University, Special Metals Co., GE Energy  
**Project PI:** Xingbo Liu  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$375,473  
**Cost Share:** \$150,859  
**Project Total:** \$526,332  
**Submitted:** September 2004  
**Status:** Awarded  
**Award Date:** August 2005

## **PREDICTIVE TECHNOLOGY TO PREVENT SOLIDIFICATION DEFECTS FOR LARGE CASTINGS USED IN ADVANCED ELECTRIC POWER SYSTEMS (PRE-APPLICATION)**

**Research Team:** West Virginia University, Pennsylvania State University, Special Metals, GE Power Systems  
**Project PI:** Xingbo Liu  
**Agency:** U.S. Department of Energy STAC  
**Agency Request:** \$400,000  
**Cost Share:** \$110,000  
**Project Total:** \$510,000  
**Submitted:** May 2004  
**Status:** Accepted for full proposal submission

## **SENSORS WITH INTELLIGENT PROCESSING FOR ENGINE-GENERATOR HEALTH MONITORING**

**Research Team:** West Virginia University, Atkinson LLC, Colorado State University  
**Project PI:** Nigel Clark  
**Agency:** U.S. Department of Energy STAC  
**Agency Request:** \$270,000  
**Cost Share:** \$ 67,500  
**Project Total:** \$337,500  
**Submitted:** May 2004  
**Status:** Not accepted for full proposal

## **IMF PROJECT SUBTASK ENERGY ASSESSMENT**

**Research Team:** West Virginia University, Oak Ridge National Laboratory  
**Project PI:** B. Gopalakrishnan  
**Agency:** U.S. Department of Energy  
**Project Total:** \$30,000  
**Submitted:** February 2004  
**Status:** Awarded  
**Award Date:** July 2004

## **ENERGY ASSESSMENTS FOR WEST VIRGINIA INDUSTRIES OF THE FUTURE OF (IOF)**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** B. Gopalakrishnan  
**Agency:** West Virginia Development Office  
**Project Total:** \$75,000  
**Submitted:** June 2003  
**Status:** Awarded  
**Award Date:** October 2003

## **ESTABLISHING THE MID-ATLANTIC REGIONAL COOLING HEATING AND POWER CENTER**

**Research Team:** University of Maryland, Rutgers's University, West Virginia University, Maryland Energy Administration  
**Project PI:** Carl Irwin, Christina Mudd  
**Agency:** U.S. Department of Energy through the Maryland Energy Administration  
**Agency Request:** \$419,137  
**Cost Share:** \$136,000  
**Project Total:** \$555,137  
**Submitted:** May 2003  
**Status:** Awarded  
**Award Date:** April 2004

## **INTELLIGENT MANUFACTURING SYSTEMS FOR PLANT PERFORMANCE OPTIMIZATION**

**Research Team:** Applied Industrial Solutions, LLC, West Virginia University, Intelligent Laboratory Solutions, Inc., Westmar Design, Inc., Century Aluminum, Trus Joist Division of Weyerhaeuser, PPG Industries, Inc., Dow Chemical

**Project PI:** Larry Banta, Jan Berkow  
**Agency:** U.S. Department of Energy

**Agency Request:** \$2,233,754  
**Cost Share:** \$2,233,754  
**Project Total:** \$4,467,508  
**Submitted:** April 2003  
**Status:** Not funded

## **CENTER FOR ADVANCED INDUSTRIAL MATERIALS**

**Research Team:** West Virginia University

**Project PI:** Xingbo Liu  
**Agency:** West Virginia University

**Project Total:** \$450,000  
**Submitted:** March 2003  
**Status:** Not accepted for full proposal

## **MULTIFUNCTIONAL METALLIC AND REFRACTORY MATERIALS FOR ENERGY EFFICIENT HANDLING OF MOLTEN METALS**

**Research Team:** West Virginia University, AK Steel Corporation, Blasch Precision Ceramics, Deloro Stellite, Tweed, Duraloy Technologies, Inc., Energy Industries of Ohio, International Lead Zinc Research Organization, Inc., Metallics, Missouri Refractories Company, Inc., Oak Ridge National Laboratory, Pechiney Rolled Products, Praxair Surface Technologies, Secat, Inc., Special Metals Corporation, Storm Rapid Response Center, Teck Cominco Metals Ltd., Vesuvius McDanel, Weirton Steel Corporation, West Virginia Futures, Inc.

**Project PI:** Ever Barbero  
**Agency:** U.S. Department of Energy

**Agency Request:** \$2,909,928  
**Cost Share:** \$2,772,863  
**Project Total:** \$5,682,791  
**Submitted:** February 2003  
**Status:** Awarded  
**Award Date:** March 2004

## **NANOTECHNOLOGY: A NOVEL APPROACH TO PREVENT BIOCIDES LEACHING**

**Research Team:** West Virginia University, Michigan Tech, Michigan State

**Project PI:** Ben Dawson-Andoh  
**Agency:** WVU Research Corporation Program to Stimulate Competitive Research (PSCoR)

**Project Total:** \$141,500  
**Submitted:** February 2003  
**Status:** Not funded

## **DEVELOPMENT AND PRODUCTION OF FIBER REINFORCED POLYMER COMPOSITE UTILITY POLES AND GUARDRAIL POSTS**

**Research Team:** West Virginia University  
**Project PI:** GangaRao Hota  
**Agency:** West Virginia University Research Corporation Program to Stimulate Interdisciplinary Research (PSIR)  
**Project Total:** \$179,363  
**Submitted:** January 2003  
**Status:** Not funded

## **INTELLIGENT SYSTEMS CENTER OF EXCELLENCE**

**Research Team:** West Virginia University  
**Project PI:** Larry Banta, Carl Irwin  
**Agency:** West Virginia University Research Corporation Program to Stimulate Interdisciplinary Research (PSIR)  
**Project Total:** \$398,928  
**Submitted:** January 2003  
**Status:** Not funded

## **CONTINUOUS AUDITING TO IMPROVE TRUST IN SUPPLY CHAINS**

**Research Team:** West Virginia University  
**Project PI:** Bonnie Morris  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$25,000  
**Cost Share:** \$25,000  
**Project Total:** \$50,000  
**Submitted:** January 2003  
**Status:** Awarded  
**Award Date:** March 2003

## **ASSESSMENT TOOLS FOR DEVELOPING CHP MARKETS**

**Research Team:** West Virginia University, Morris Energy Consultant  
**Project PI:** Robert Creese  
**Agency:** U.S. Department of Energy  
**Project Total:** \$300,000  
**Submitted:** August 2002  
**Status:** Not funded

## **ENERGY ASSESSMENTS FOR WEST VIRGINIA INDUSTRIES OF THE FUTURE OF (IOF)**

**Research Team:** West Virginia University  
**Project PI:** B. Gopalakrishnan  
**Agency:** West Virginia Development Office  
**Project Total:** \$75,000  
**Submitted:** June 2002  
**Status:** Awarded  
**Award Date:** October 2002

### **MULTI-CELL JIGGING AND FLOTATION FOR IMPROVED RECOVERY OF COAL FINES**

**Research Team:** Mineral Technologies International, Inc.  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy NICE3  
**Agency Request:** \$495,000  
**Cost Share:** \$495,000  
**Project Total:** \$990,000  
**Submitted:** June 2002  
**Status:** Not funded

### **MULTI-CELL JIGGING AND FLOTATION FOR IMPROVED RECOVERY OF COAL FINES (PRE-PROPOSAL)**

**Research Team:** Mineral Technologies International, Inc.  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy NICE3  
**Agency Request:** \$ 500,000  
**Cost Share:** \$ 500,000  
**Project Total:** \$1,000,000  
**Submitted:** June 2002  
**Status:** accepted for full proposal submission

### **PROJECTS WITH INDUSTRY**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** Ken Means  
**Agency:** West Virginia Development Office  
**Project Total:** \$120,000  
**Submitted:** June 2002  
**Status:** Awarded  
**Award Date:** October 2002

### **DIVERSIFIED ENERGY EDUCATION IN A COAL-FIRED STATE**

**Research Team:** American Electric Power, West Virginia Department of Education  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$33,500  
**Cost Share:** \$42,250  
**Project Total:** \$75,750  
**Submitted:** March 2002  
**Status:** Not funded

## **FUEL CELL ENGINEERING AND TESTING IN A COMMERCIAL RESEARCH PARK**

**Research Team:** Augusta Systems  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$77,490  
**Cost Share:** \$21,500  
**Project Total:** \$98,990  
**Submitted:** March 2002  
**Status:** Not funded

## **INDUSTRIAL ASSESSMENT CENTER PROGRAM**

**Research Team:** West Virginia University, West Virginia Industry  
**Project PI:** Ralph Plummer, B. Gopalakrishnan  
**Agency:** U.S. Department of Energy  
**Project Total:** \$813,578  
**Submitted:** March 2002  
**Status:** Awarded  
**Award Date:** September 2002

## **ON-FARM GENERATION OF ELECTRICITY AND DIESEL FUEL FROM MANURE**

**Research Team:** West Virginia University, National Pork Board, NorthCo Corporation, West Virginia Department of Agriculture, Allegheny Wood Products  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$100,000  
**Cost Share:** \$134,521  
**Project Total:** \$234,521  
**Submitted:** March 2002  
**Status:** Not funded

## **USE OF FINES AND MIDLINGS FOR DISTRIBUTIVE GENERATION AT RURAL INDUSTRIAL SITES**

**Research Team:** Coaltec Energy, Coastal Coal  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$100,000  
**Cost Share:** \$134,521  
**Project Total:** \$234,521  
**Submitted:** March 2002  
**Status:** Not funded

### **FUEL CELL ENGINEERING AND TESTING IN A COMMERCIAL RESEARCH PARK (PRE-PROPOSAL)**

**Research Team:** Augusta Systems  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$77,490  
**Cost Share:** \$21,500  
**Project Total:** \$98,990  
**Submitted:** January 2002  
**Status:** accepted for full proposal submission  
**Award Date:** May 2002

### **COST EVALUATION OF A NOVEL 5KW DIESEL POWERED FUEL AUXILIARY UNIT (APU)**

**Research Team:** West Virginia University  
**Project PI:** Robert Creese  
**Agency:** U.S. Department of Energy  
**Project Total:** \$24,992  
**Submitted:** November 2001  
**Status:** Awarded  
**Award Date:** May 2002

### **RADIANT TRUST CENTER OF EXCELLENCE-CONTINUOUS AUDITING TO IMPROVE TRUST IN SUPPLY CHAINS**

**Research Team:** West Virginia University  
**Project PI:** Bonnie Morris  
**Agency:** U.S. Department of Energy  
**Project Total:** \$22,250  
**Submitted:** October 2001  
**Status:** Awarded  
**Award Date:** January 2002

### **DEVELOPMENT OF TECHNOLOGY FOR DIRECT, ON-SITE CONVERSION OF SAWMILL RESIDUE AND POULTRY LITTER TO LIQUID FUELS AND CHEMICALS ON-SITE**

**Research Team:** Allegheny Wood Products, Taz Hardwoods Inc., Northco Inc., West Virginia Department of Agriculture, West Virginia University  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy  
**Project Total:** \$673,262  
**Submitted:** July 2001  
**Status:** Awarded  
**Award Date:** October 2001

## **EXPERT CONTROL SYSTEMS TO OPTIMIZE INTERGRATION OF MULTIPLE ENERGY SOURCES**

**Research Team:** Augusta Systems  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy  
**Project Total:** \$571,600  
**Submitted:** July 2001  
**Status:** Not funded

## **INFORMATION TECHNOLOGY "BEST PRACTICES" ASSESSMENT FOR INDUSTRIES OF THE FUTURE WEST VIRGINIA COMPANIES (PROJECT CONCEPT PAPER)**

**Research Team:** Applied Industrial Solutions LLC, West Virginia University  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Submitted:** July 2001  
**Status:** Not accepted for full proposal

## **POWERED METAL COATING OVEN DEVELOPMENT**

**Research Team:** Precision Electric, West Virginia University, West Virginia Development Office  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy NICE3  
**Agency Request:** \$494,000  
**Cost Share:** \$494,000  
**Project Total:** \$988,000  
**Submitted:** July 2001  
**Status:** Not funded

## **DEVELOPMENT OF A CURING OVEN FOR POWDER COATINGS UTILIZING THE INNOVATIVE APPLICATION OF TRADITIONAL TECHNOLOGY FOR VARYING THE MULTIPLE PROCESS ELEMENTS THAT DISTRIBUTE AND CONTROL HEAT**

**Research Team:** Precision Electric, Inc., West Virginia Development Office  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy NICE3  
**Agency Request:** \$494,000  
**Cost Share:** \$494,000  
**Project Total:** \$988,000  
**Submitted:** June 2001  
**Status:** Not funded

**DISTRIBUTED ADVANCED POWER GENERATION APPLICATION FOR COMMERCIAL FACILITIES (PRE-PROPOSAL)**

**Research Team:** West Virginia University, West Virginia Development Office (WVDO), Whitman Augusta (WA), Center for Energy Development and Environmental Assessment (CEDEA), Allegheny Energy Solutions, U.S. DOE National Energy Technology Laboratory

**Project PI:** Jeff Herholdt

**Agency:** U.S. Department of Energy

**Agency Request:** \$398,400

**Cost Share:** \$ 99,600

**Project Total:** \$498,000

**Submitted:** May 2001

**Status:** Not accepted for full proposal

**ENGINE AND FLEET PERFORMANCE TESTING OF BIODIESEL DERIVED BY DIRECT CONVERSION OF ANIMAL MANURES AND OTHER WASTE BIOMASS (PRE-PROPOSAL)**

**Research Team:** Monongalia County Board of Education, U.S. DOE National Energy Technology Laboratory, Allegheny Wood Products, Taz Hardwoods Inc., Northco, Inc., West Virginia Department of Agriculture, West Virginia University

**Project PI:** Jeff Herholdt

**Agency:** U.S. Department of Energy

**Agency Request:** \$470,000

**Cost Share:** \$117,500

**Project Total:** \$587,500

**Submitted:** May 2001

**Status:** Accepted for full proposal submission

**ESTABLISHMENT OF PERFORMANCE, EMISSIONS AND OPERATIONAL BASELINE FOR NOVEL LNG ENGINES IN SUPPORT OF EMERGING APPALACHIAN LNG CORRIDOR (PRE-PROPOSAL)**

**Research Team:** West Virginia University, Appalachian-Pacific, LLC, I-79 Clean Corridor

**Project PI:** Jeff Herholdt

**Agency:** U.S. Department of Energy

**Agency Request:** \$700,000

**Cost Share:** \$230,000

**Project Total:** \$930,000

**Submitted:** May 2001

**Status:** Not accepted for full proposal

## **WEST VIRGINIA ARMY NATIONAL GUARD- ENERGY SELF SUFFICIENCY AND ADVANCED POWER GENERATION (PRE-PROPOSAL)**

**Research Team:** West Virginia University, West Virginia Army National Guard, West Virginia Development Office, Augusta Systems, U.S. DOE National Energy Technology Laboratory, Allegheny Energy Solutions

**Project PI:** Jeff Herholdt

**Agency:** U.S. Department of Energy

**Agency Request:** \$620,000

**Cost Share:** \$155,000

**Project Total:** \$775,000

**Submitted:** May 2001

**Status:** Not accepted for full proposal

## **FEMP U.S. BUREAU OF ENGRAVING AND PRINTING ENERGY ASSESSMENT**

**Research Team:** West Virginia University

**Project PI:** B. Gopalakrishnan

**Agency:** U.S. Department of Energy

**Project Total:** \$11,150

**Submitted:** February 2001

**Status:** Awarded

**Award Date:** May 2001

## **INDUSTRIAL ENERGY EFFICIENCY PROGRAM**

**Research Team:** West Virginia University, West Virginia Development Office

**Project PI:** Ken Means

**Agency:** West Virginia Development Office

**Project Total:** \$120,000

**Submitted:** June 2000

**Status:** Awarded

**Award Date:** October 2000

## **DEVELOPMENT AND CHARACTERIZATION OF VACUUM-FORMING PROCESS FOR THE FABRICATION OF CERAMIC-COMPOSITE BASED STRUCTURES USED IN EXTREME THERMAL ENVIRONMENTS**

**Research Team:** Danser Inc., West Virginia Development Office

**Project PI:** Jeff Herholdt

**Agency:** U.S. Department of Energy NICE3

**Agency Request:** \$250,000

**Cost Share:** \$250,000

**Project Total:** \$500,000

**Submitted:** March 2000

**Status:** Not funded

**ENERGY ANALYSIS AND DIAGNOSTICS AT THE NEW RIVER GORGE NATIONAL RIVER, NATIONAL PARK SERVICE**

**Research Team:** West Virginia University  
**Project PI:** B. Gopalakrishnan  
**Agency:** U.S. Department of Energy  
**Project Total:** \$12,500  
**Submitted:** January 1999  
**Status:** Awarded  
**Award Date:** May 1999

**RESTRUCTURING AND DEREGULATION OF THE ELECTRIC UTILITY INDUSTRY IN WEST VIRGINIA: PROPOSAL FOR ADVISORY AND TECHNICAL SERVICES TO THE PUBLIC SERVICE COMMISSION OF WEST VIRGINIA**

**Research Team:** West Virginia University, WV Public Service Commission  
**Project PI:** Carl Irwin  
**Agency:** WV Public Service Commission  
**Project Total:** \$50,000  
**Submitted:** June 1999  
**Status:** Awarded  
**Award Date:** July 1999

**IMPROVED GRAIN REFINING (THE FY-GEM PROCESS)**

**Research Team:** Jamegy Development Corporation, West Virginia Development Office  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. Department of Energy NICE3  
**Agency Request:** \$500,000  
**Cost Share:** \$500,000  
**Project Total:** \$1,000,000  
**Submitted:** March 1999  
**Status:** Not funded

**TESTING AND DEVELOPMENT OF AN ALTERNATIVE CARBON SOURCE FOR IMPROVED CARBON ANODES AND ELECTRODES**

**Research Team:** UCAR Carbon Company  
**Project PI:** Jeff Herholdt  
**Agency:** U.S. DOE NICE3  
**Agency Request:** \$250,000  
**Cost Share:** \$250,000  
**Project Total:** \$500,000  
**Submitted:** March 1999  
**Status:** Not funded

### **INDUSTRIAL ENERGY EFFICIENCY PROGRAM**

**Research Team:** West Virginia University  
**Project PI:** Ed Sneckenberger  
**Agency:** West Virginia Development Office  
**Project Total:** \$120,000  
**Submitted:** June 1998  
**Status:** Awarded  
**Award Date:** October 1998

### **POTENTIAL IMPACTS OF DISTRIBUTED GENERATION IN WEST VIRGINIA**

**Research Team:** West Virginia University, West Virginia Governor's Office  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$50,000  
**Cost Share:** \$20,000  
**Project Total:** \$70,000  
**Submitted:** October 1998  
**Status:** Awarded  
**Award Date:** November 1998

### **ELECTRIC INDUSTRY RESTRUCTURING: OPPORTUNITIES AND RISKS FOR WEST VIRGINIA**

**Research Team:** West Virginia University  
**Project PI:** Carl Irwin  
**Agency:** WV Public Service Commission  
**Project Total:** \$50,000  
**Submitted:** June 1997  
**Status:** Awarded  
**Award Date:** July 1997

### **PROJECTS FOR POSITIVE EFFECT OF ENERGY EFFICIENCY AND THE ENVIRONMENT**

**Research Team:** West Virginia University, Pa. Department of Environmental Protection  
**Project PI:** Ed Sneckenberger  
**Agency:** PA Dept. of Environmental Protection  
**Project Total:** \$67,250  
**Submitted:** June 1997  
**Status:** Awarded  
**Award Date:** September 1997

## **WEST VIRGINIA UNIVERSITY INDUSTRIAL ASSESSMENT CENTER**

**Research Team:** West Virginia University, West Virginia Industry  
**Project PI:** Ralph Plummer, B. Gopalakrishnan  
**Agency:** U.S. Department of Energy  
**Project Total:** \$868,500  
**Submitted:** March 1997  
**Status:** Awarded  
**Award Date:** October 1997

## **Outreach & Special Projects**

### **FY 2008 WEST VIRGINIA DIVISION OF ENERGY SUPPORT FOR INDUSTRIES OF THE FUTURE**

**Research Team:** West Virginia University, West Virginia Division of Energy  
**Project PI:** Carl Irwin  
**Agency:** West Virginia Energy Office  
**Project Total:** \$100,000  
**Submitted:** May 2007  
**Status:** Awarded  
**Award Date:** July 2007

### **EXPANDING WEST VIRGINIA ENERGY EFFICIENCY PROGRAMS THROUGH TRANSFORMATIONAL MARKET ACTIVITIES**

**Research Team:** West Virginia University, West Virginia Division of Energy  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy through the WV Division of Energy  
**Agency Request:** \$232,218  
**Cost Share:** \$242,218  
**Project Total:** \$474,436  
**Submitted:** August 2007  
**Status:** Not funded

### **IMPLEMENTATION AND FACILITATION OF ENERGY SAVING TECHNOLOGIES IN WEST VIRGINIA, TENNESSEE, KENTUCKY, OHIO AND PENNSYLVANIA**

**Research Team:** West Virginia University, West Virginia Development Office, Kentucky Energy Office, Ohio Energy Office, Tennessee Energy Office, Oak Ridge National Laboratory  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$250,000  
**Cost Share:** \$107,269  
**Project Total:** \$357,269  
**Submitted:** May 2006  
**Status:** Not funded

**FY 2007 WEST VIRGINIA DEVELOPMENT OFFICE SUPPORT FOR INDUSTRIES OF THE FUTURE - WEST VIRGINIA**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Carl Irwin  
**Agency:** West Virginia Development Office  
**Project Total:** \$100,000  
**Submitted:** June 2006  
**Status:** Awarded  
**Award Date:** July 2006

**FY 2006 WEST VIRGINIA DEVELOPMENT OFFICE SUPPORT FOR INDUSTRIES OF THE FUTURE- WEST VIRGINIA**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Carl Irwin  
**Agency:** West Virginia Development Office  
**Project Total:** \$100,000  
**Submitted:** June 2005  
**Status:** Awarded  
**Award Date:** July 2005

**2005 INDUSTRIES OF THE FUTURE - WEST VIRGINIA SPECIAL PROJECTS**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$100,000  
**Cost Share:** \$ 46,000  
**Project Total:** \$146,000  
**Submitted:** April 2005  
**Status:** Awarded  
**Award Date:** Oct-05

**INDUSTRIES OF THE FUTURE – WEST VIRGINIA (IOF-WV) 2004 STATE ENERGY PROGRAM SPECIAL PROJECTS**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$150,000  
**Cost Share:** \$133,845  
**Project Total:** \$283,845  
**Submitted:** March 2004  
**Status:** Awarded  
**Award Date:** October 2004

**FY 2005 WEST VIRGINIA DEVELOPMENT OFFICE SUPPORT PROGRAM FOR INDUSTRIES OF THE FUTURE – WEST VIRGINIA**

**Research Team:** West Virginia University, WV Development Office  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$100,000  
**Cost Share:** \$109,538  
**Project Total:** \$209,538  
**Submitted:** June 2004  
**Status:** Awarded  
**Award Date:** July 2004

**INDUSTRIES OF THE FUTURE – WEST VIRGINIA (IOF-WV) 2003 STATE ENERGY PROGRAM SPECIAL PROJECTS**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$100,000  
**Cost Share:** \$109,538  
**Project Total:** \$209,538  
**Submitted:** April 2003  
**Status:** Awarded  
**Award Date:** October 2003

**FY 2004 WEST VIRGINIA DEVELOPMENT OFFICE SUPPORT PROGRAM FOR INDUSTRIES OF THE FUTURE**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Carl Irwin  
**Agency:** West Virginia Development Office  
**Project Total:** \$200,000  
**Submitted:** June 2003  
**Status:** Awarded  
**Award Date:** July 2003

**WEST VIRGINIA DEVELOPMENT OFFICE SBDC SUPPORT FOR THE 2003 INDUSTRIES OF THE FUTURE- WEST VIRGINIA SYMPOSIUM**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Carl Irwin  
**Agency:** West Virginia Development Office  
**Project Total:** \$6,500  
**Submitted:** October 2003  
**Status:** Awarded  
**Award Date:** October 2003

**WEST VIRGINIA DEVELOPMENT OFFICE SBDC SUPPORT FOR THE 2002 INDUSTRIES OF THE FUTURE-  
WV SYMPOSIUM**

**Research Team:** West Virginia University, West Virginia Development Office  
**Project PI:** Carl Irwin  
**Agency:** West Virginia Development Office  
**Agency Request:** \$3,777  
**Cost Share:** \$3,777  
**Project Total:** \$7,554  
**Submitted:** November 2002  
**Status:** Awarded  
**Award Date:** December 2002

**FY 2003 WEST VIRGINIA DEVELOPMENT OFFICE SUPPORT PROGRAM FOR INDUSTRIES OF THE  
FUTURE-WV**

**Research Team:** West Virginia University Industries of the Future Team, WV Development Office  
**Project PI:** Carl Irwin  
**Agency:** West Virginia Development Office  
**Project Total:** \$200,000  
**Submitted:** June 2002  
**Status:** Awarded  
**Award Date:** July 2002

**INDUSTRIES OF THE FUTURE – WEST VIRGINIA (IOF-WV) SPECIAL PROJECTS SUBMISSION 2002**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia  
Industry  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$100,000  
**Cost Share:** \$ 46,000  
**Project Total:** \$146,000  
**Submitted:** March 2002  
**Status:** Awarded  
**Award Date:** May 2002

**CONTINUATION OF THE WEST VIRGINIA PROGRAM ON OUTREACH STRATEGIES TO PROMOTE STATE-  
LEVEL PARTNERSHIPS THAT EXPAND PARTICIPATION IN INDUSTRIES OF THE FUTURE**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia  
Industry  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$ 79,149  
**Cost Share:** \$ 41,096  
**Project Total:** \$120,245  
**Submitted:** April 2002  
**Status:** Awarded  
**Award Date:** October 2002

**OUTREACH STRATEGIES TO PROMOTE STATE-LEVEL PARTNERSHIPS THAT EXPAND PARTICIPATION IN INDUSTRIES OF THE FUTURE**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$50,000  
**Cost Share:** \$21,052  
**Project Total:** \$71,052  
**Submitted:** January 2001  
**Status:** Awarded  
**Award Date:** October 2001

**INDUSTRIES OF THE FUTURE – WEST VIRGINIA (IOF-WV) SPECIAL PROJECTS SUBMISSION 2001**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$200,000  
**Cost Share:** \$120,000  
**Project Total:** \$320,000  
**Submitted:** February 2001  
**Status:** Awarded  
**Award Date:** October 2005

**INDUSTRIES OF THE FUTURE- WEST VIRGINIA 2000, SPECIAL PROJECTS SUBMISSION**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$200,000  
**Cost Share:** \$242,000  
**Project Total:** \$442,000  
**Submitted:** February 2000  
**Status:** Awarded  
**Award Date:** October 2000

### **INDUSTRIES OF THE FUTURE- WEST VIRGINIA 1999 SPECIAL PROJECTS SUBMISSION**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$185,000  
**Cost Share:** \$ 88,850  
**Project Total:** \$273,850  
**Submitted:** February 1999  
**Status:** Awarded  
**Award Date:** October 1999

### **INDUSTRIES OF THE FUTURE- WEST VIRGINIA (IOF-WV)**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$152,155  
**Cost Share:** \$ 30,000  
**Project Total:** \$182,155  
**Submitted:** February 1998  
**Status:** Awarded  
**Award Date:** October 1998

### **INDUSTRIES OF THE FUTURE- WEST VIRGINIA (IOF-WV)**

**Research Team:** West Virginia University, West Virginia Development Office, West Virginia Industry  
**Project PI:** Carl Irwin  
**Agency:** U.S. Department of Energy  
**Agency Request:** \$100,000  
**Cost Share:** \$ 46,000  
**Project Total:** \$146,000  
**Submitted:** February 1997  
**Status:** Awarded  
**Award Date:** October 1997