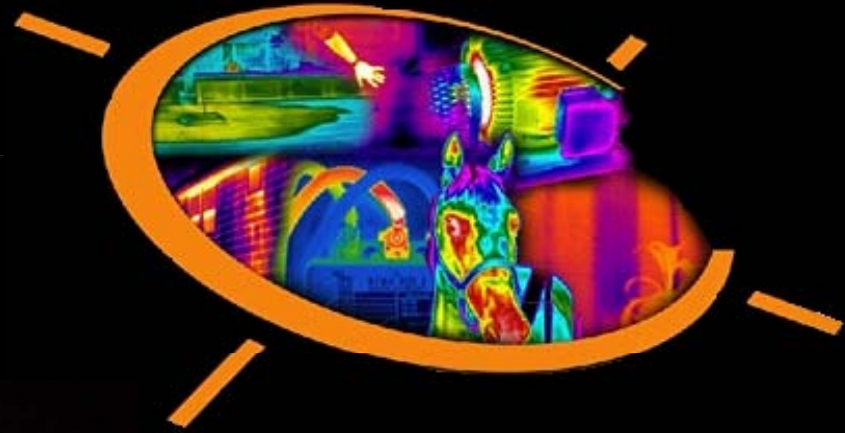




RESNET CONFERENCE February 17, 2009

"Truth Behind The Walls"



*Presented by: Peter Hopkins
Certified Level II Thermographer*

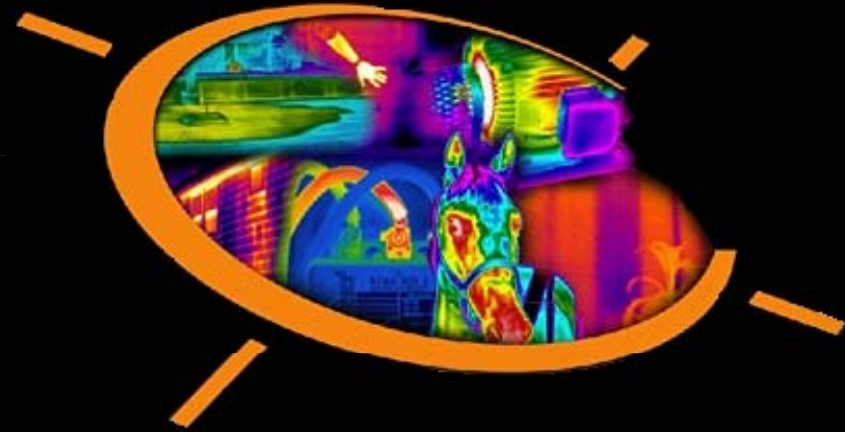


United Infrared, Inc.



RESNET CONFERENCE February 17, 2009

“Truth Behind The Walls”



Determining Quality Insulation Installation Through Infrared Testing



Presented by: **Peter Hopkins**
Certified Level II Thermographer



United Infrared, Inc.



RESNET CONFERENCE February 17, 2009

"Truth Behind The Walls"



Determining Quality Insulation Installation Through Infrared Testing



Presented by: **Peter Hopkins**
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United Infrared, Inc.



Seminar Outline

- Who is SoCal Infrared/United Infrared? (5 min)
- Standards (10 min)
- How to do it (5 min)
- Case studies (25 min)
- Case studies continued (10 minutes)
- Marketing (10 min)
- Questions & Answers (30 min)



SoCal Infrared



- Division of InspecDoc Inspection Services, Inc.
 - Home Inspection company servicing Southern California since 1994.
 - Became multi inspector firm in 1999
 - Rode the wonderful Real Estate market for 13 years and expanded to 4 inspectors.



SoCal Infrared



- SoCal Infrared
 - Concept in 1999, Reality in 2005
 - Camera Cost (\$50,000 back then) and no time to take on additional business (Real Estate was booming) major reason for delay in starting business.
 - Purchased IR camera & 3 Trainings 2005
 - First inspection end of 2005 (roof), officially opened doors Jan 2006

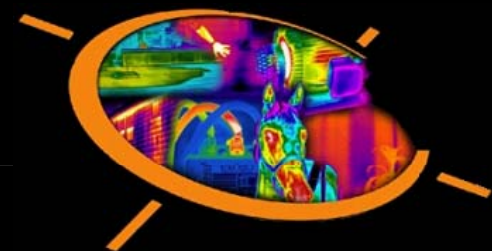


United Infrared, Inc.



- Launched January 2009
- Partnership of Greg Stockton (stocktoninfrared.com) & Peter Hopkins (socalinfrared.com)
- Created to fill the void in the market of application specific training and marketing
- National Network of Local Thermographers
- www.unitedinfrared.com for more info





SoCal Infrared: Peter Hopkins

- Level II Thermographer: ITC, Infrared Training Center
- ICC Certified: International Code Council, 5 Certifications
- ABS Certified: American Bureau of Shipping: Marine Infrared
- HERS Rater: CHEERS
- Energy Checkup: Certified Inspector
- CREIA: Certified Inspector and New Construction Specialist
- FEMA: Disaster Housing Inspector PARR Inspections
- Published Author: "Thermal Imaging Scan Reveals The Truth Behind the Walls: 2006", "From Houses to Horses:2007", "Go Green with Thermal Imaging: 2008"
- Speaker on various topics within applications of Infrared.





Introduction to Infrared

- For most, what introduced public to infrared!



What is the name of this 1987 movie?

Who are the two Governors?

Who did the Infrared in this movie?

Predator

Arnold & Jesse Ventura

Flir Systems





Standards and References

- Builders are required to comply with installation requirements regardless of whether or not they take the energy credit.
- Building codes state items to be installed per manufacture specifications.
- Manufactures specifications state it must be done right.
- National Association of Home Builders talks about what must be done when it is done wrong!



Standards & References

- Uniform Building Code:
 - Required Inspections: (108.5 1997 Uniform Building Code)

- Foundation



- Concrete Slab or Under floor



- Frame Inspection



- Lath or Gypsum



- Final Inspection



- **WHERE IS THE INSULATION INSPECTION?**





Standards & References

- 108.7 UBC: **SPECIAL INSPECTIONS.** The building official may make or require other inspections
- We have found that many jurisdictions do have insulation inspections but not all do.
- i.e. phone message to SoCal Infrared





Standards & References

- IECC: International Energy Conservation Code: (102.2: 2000 IECC) All insulation materials, caulking and weatherstripping, fenestration assemblies, mechanical equipment and systems components, and water-heating equipment and system components shall be installed in accordance with the manufacture's installation instructions.





Standards and References

- Most if not all codes will reference manufactures specifications. For insulation purposes, The main Manufactures are part of NAIMA.





Insulation Installation

- FOR INSULATION WHAT DOES THIS MEAN?
- NAIMA: North America Insulation Manufacturers Association



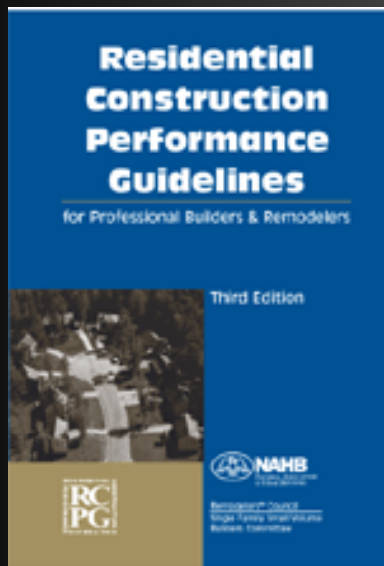
[25 CHECKPOINTS FOR INSPECTING INSULATING JOBS](#)



National Association of Home Builders



NAHB
NATIONAL ASSOCIATION
OF HOME BUILDERS



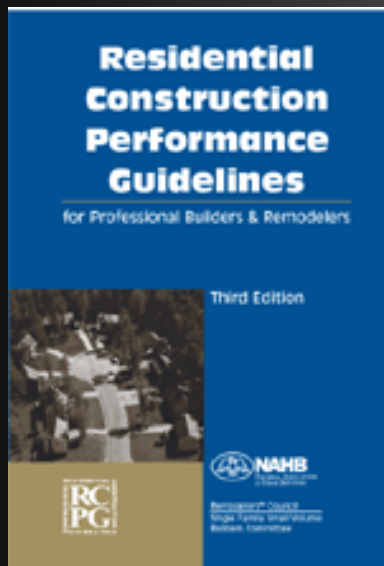
Insulation: Section 4-4

- Observation: Insulation insufficient
- Performance Guideline: The contractor shall install insulation according to R-Values designated in the contract documents.
- Corrective Measure: The contractor will install insulation to meet the performance guideline.
- Discussion: Proper installation shall include correct placement behind electrical boxes, backing studs, corner framing and wiring.

National Association of Home Builders



NAHB
NATIONAL ASSOCIATION
OF HOME BUILDERS



Interior Climate Control: Air Infiltration and Drafts Section 8-1

- Observation: Air infiltrates around door or window
- Performance Guideline: Some infiltration is usually noticeable around doors and windows especially during high winds. No daylight shall be visible around frame when door or window is closed.
- Corrective Measure: The contractor shall repair to meet the performance guideline.
- Discussion: Proper repair can be affected by adjusting or installing weatherstripping around doors and windows. In high-wind areas, the owner may need to have storm windows and doors installed to eliminate drafts.





Performing an Infrared Inspection

- **KNOW ASTM 1060C :Standard Practice**
 - “Thermographic Inspection of Insulation Installations in Envelope Cavities of Frame Buildings”. Standards can be downloaded at www.astm.org
 - **GENERAL REQUIREMENTS**
 - Home must be heated/cooled approx 4 hours prior to actual inspection to create a proper delta T (sometimes 2 hours may be all that is needed)
 - 18 degree delta T is recommended (outside to inside)
 - During cooler months, these are typically done in morning or evening, in warmer months typically done in mid afternoon.
 - Usually we don't do inspections unless outside temperature is under 60 degrees or over 85 degrees. (Kind of hard to get home over 80 degrees with heat during winter and kind of hard to get it under 67 during the summer. For California, we pretty much can do them year round, we just need to be flexible when we do the inspections.





Performing an Infrared Inspection

- TUESDAY 3:30-5pm (today)
- **Introduction to the New RESNET Infrared Standard**
Presenters:
Rogge Miller, Guaranteed Watt Savers
John Snell, Snell Infrared
St. Anne Room
- This session will define the means by which the Standard was developed, its intention, present the highlights of the Standard, and seek feedback from those in the presentation.





Performing an Infrared Inspections

- Set up appointment with client, let them know what to expect from your examination, talk about what Infrared can actually do and how a proper delta T will ensure the best imaging session.
- Call Client evening before to remind them if heat is to be turned on or morning of to verify they are to have A/C system set on prior to your arrival in an effort to avoid unnecessary time charges
- Verify weather during week before to make sure delta T's can be achieved (not uncommon to have to reschedule as the weatherman doesn't always have it right).



Performing an Infrared Inspection



■ Tools needed

- IR Camera of course
- Recommended to have a digital thermometer (inside/outside zone) (take a picture of it to prove the 18 deg split)
- Ladder for Attic visual inspection (confirm when at all possible conditions that you see with infrared camera)
- Digital camera (for those visual shots in attic and home of thermals)
- Notepad or recording device (take notes of where each image is taken)
- Reporting software (something to create final report with)
- Blower Door (for quantitative analysis)



Case Studies #1



Welcome to

INFRAMATION

The Thermographer's Conference

Thermal Imaging Scan Reveals the
Truth behind the Wall

Peter Hopkins

ICC Certified Building Inspector, Level I Thermographer
SoCal Infrared (www.socalinfrared.com)

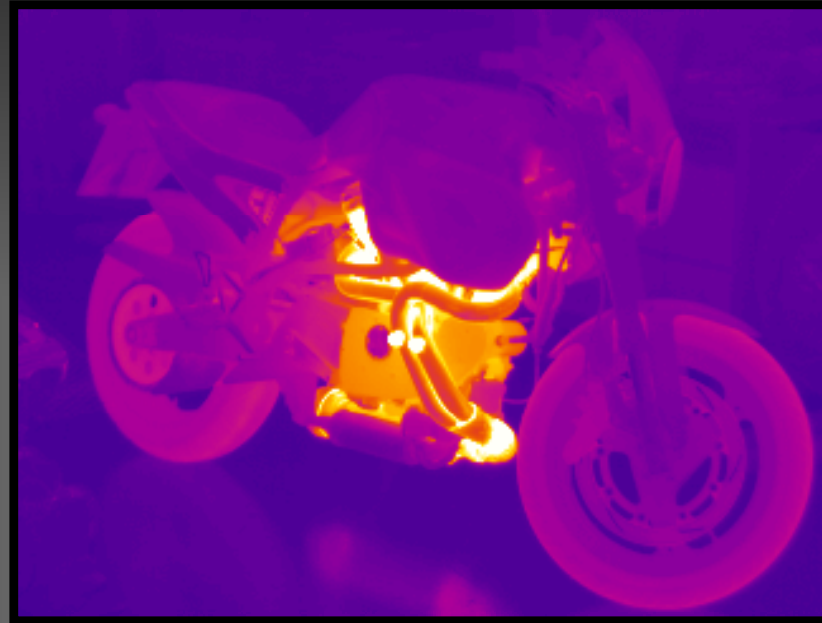
Where you learn about thermography applications from your peers.



BREAK TIME



- 10 second break





Case Study #2

- 8000 Sq foot Custom Home: Toluca Lake, CA





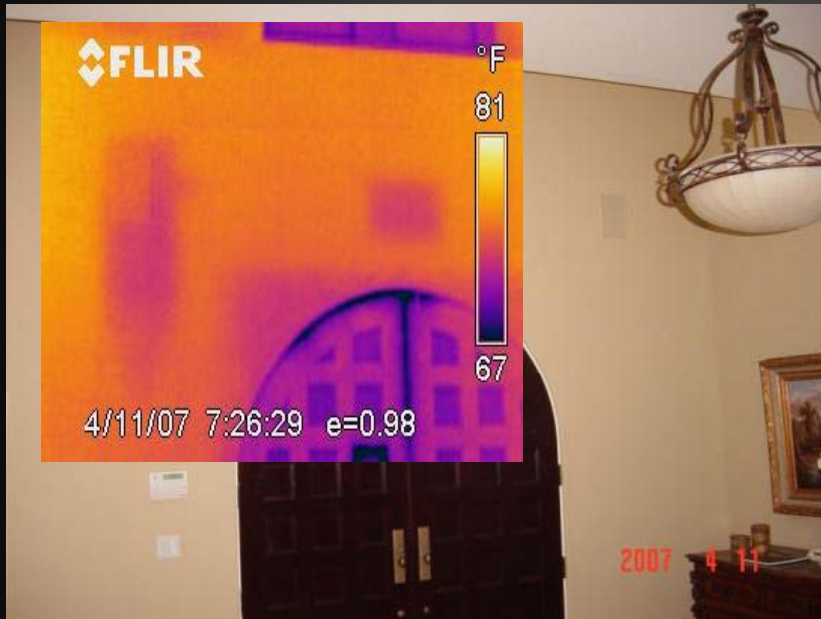
Case Study #2

- 55 Locations of missing insulation identified during our 3 hour site review.



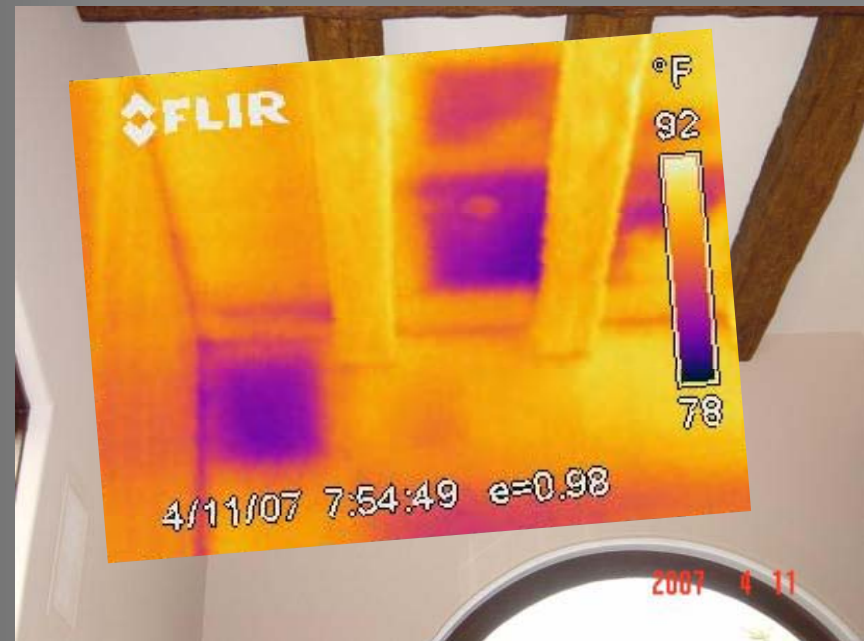


Case Study #2



Weatherstripping at exterior doors

Walls, Ceiling, Can lights!



Case Study #2



Interior Wall but there is a attic behind this "Knee wall"



Confirm with visual pictures at every given opportunity!





Case Study #2



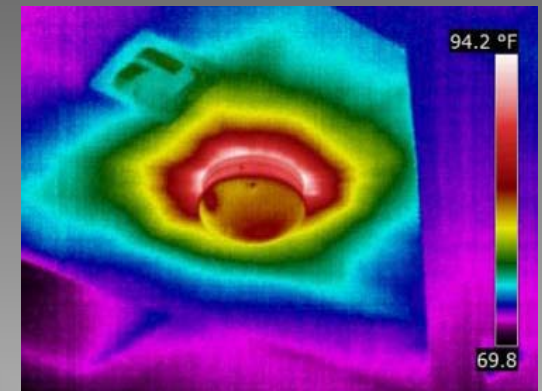
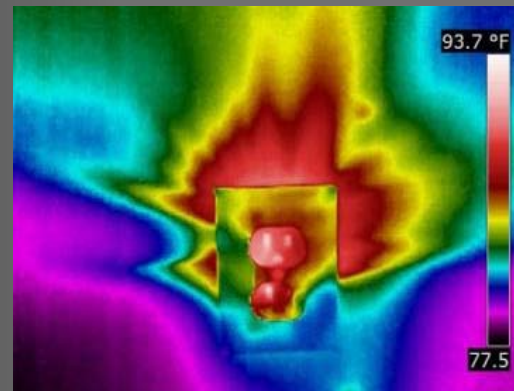
Attic Access: Almost guaranteed you will have no insulation on cover although it has been always required.



Qualitative vs. Quatitative



- An Infrared only review is Qualitative by design.
- A Infrared in conjunction with a Blower Door test has a quantitative value. (i.e. ACH50) for air leakage.



Results

	Units	Depressurize
Air Flow Coefficient,CL	(cfm)	204.145
Air flow Exponent		0.6201
Confidence Factor	(%)	99.97
Flow@ 50 Pa	(cfm)	2309.46
Air Changes/Hour @ 50 Pa	(/hr)	9.588
Air Permeability@ 50 Pa	(cfm/ft ²)	0.75
Specific Leakage Rate @ 50 Pa	(cfm/ft ²)	0.95



Qualitative vs. Quatitative



- An Infrared test alone may not clearly show all the leakage locations.



Infrared view, standard building pressure



Infrared viewed with negative pressure





Statistics

- Several years into doing scans now, we have not had a home comply to Title 24 (Calif. Energy Code) yet
- We are not sure there is one either!
- With utilities getting only higher, clients are getting more and more energy conscious and the fact is that Infrared can show them where the money is floating out the door.
- Infrared is a Win-Win situation, you help the client, they have less utility consumption, you make some money along the way



Marketing



- Who do we market too?
 - New home buyers
 - Homeowners concerned with their utility bills
 - People who want to “Go Green”
 - Retrofit clients “older home that didn’t have insulation and have recently paid to have it installed” [sample report](#)
 - People who have drafts or cold spots in their home



Marketing



- Did you know that the U.S. Department of Energy recommends a thermographic inspection!



[U.S. Department of Energy - Energy Efficiency and Renewable Energy](#)
[A Consumer's Guide to Energy Efficiency and Renewable Energy](#)
[Thermographic Inspections](#)



Marketing



- **Creating the WOW Factor!**
 - **BROCHURE (have something to tell people what you do!)**

SoCal Infrared provides your home or business with a comprehensive infrared inspection.



Equipped with FLIR Systems infrared cameras utilizing the latest in IR technology, SoCal Infrared offers a non-invasive means of monitoring and diagnosing the condition of residential, commercial and industrial properties.




Do you have a **leaky roof**, **high energy bills**, or a **mysterious water leak**?

Get the answers you need to take corrective action from our team of certified thermographers.



SoCal Infrared
Servicing Southern California
Toll free 888-SO CAL IR (762-2547)
Fax 888-747-0277
www.socalinfrared.com
info@socalinfrared.com

What is Thermography?

A diagnostic technique in which a thermal imaging camera is used to measure temperature variations, thereby pinpointing root causes of water intrusion, thermal inefficiency, and other problem areas. By locating exactly where a problem originated from with an infrared scan, costly destruction is eliminated.

Energy Efficiency

According to the U.S. Department of Energy, the typical family spends close to \$1,300 a year on their home's utility bills, and unfortunately, a large portion of that energy is wasted due to insufficient insulation and a lack of weather stripping around doors and windows.



Through an infrared scan we can show you where your home or facility needs proper insulation in order to improve energy efficiency, thus leading to savings on energy costs.

Moisture Intrusion

Infrared helps win the battle against moisture and mold in building materials that can destroy structural integrity and cause serious health concerns. Our experts can distinguish between wet and dry building materials via infrared technology - tracking moisture intrusion to its source - clearly revealing problem areas that need to be addressed, before they become more severe.

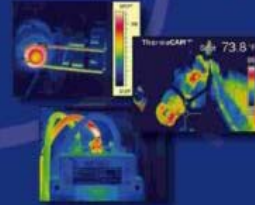


Other Services

We offer additional services to accommodate your electrical, mechanical, and equipment needs. Contact us for your specific needs and see what infrared can do for you!

Built Up Roofing (BUR) Inspection

Infrared inspection has proven to be an excellent method for predictive maintenance of roofing. Through expert examination and reporting of a roof's condition using an infrared camera, SoCal Infrared takes the "guess work" out of roofing analysis - pinpointing any areas of moisture intrusion, questionable structural integrity, or energy inefficiency - we give you the answers you need to make repairs with confidence - the first time. Our methods are cost-effective and non-destructive - giving you peace-of-mind as well.





Marketing



- Business Cards (Matching?)



Marketing



- Mobile Billboard?



Once our mobile billboard was completed, we noticed about a 300% increase in our web traffic. It is not uncommon for people to ask for my business card when we are out.

The colors of infrared definitely get attention!



Marketing



- Mobile Billboard?



Once our mobile billboard was completed, we noticed about a 300% increase in our web traffic. It is not uncommon for people to ask for my business card when we are out.

The colors of infrared definitely get attention!



Marketing



- Postcards

SoCal Infrared
Thermal Imaging Services

New Home?

Do you have missing insulation in your walls?

Thermal images showing missing insulation

An infrared scan tells the truth behind the walls!



Marketing



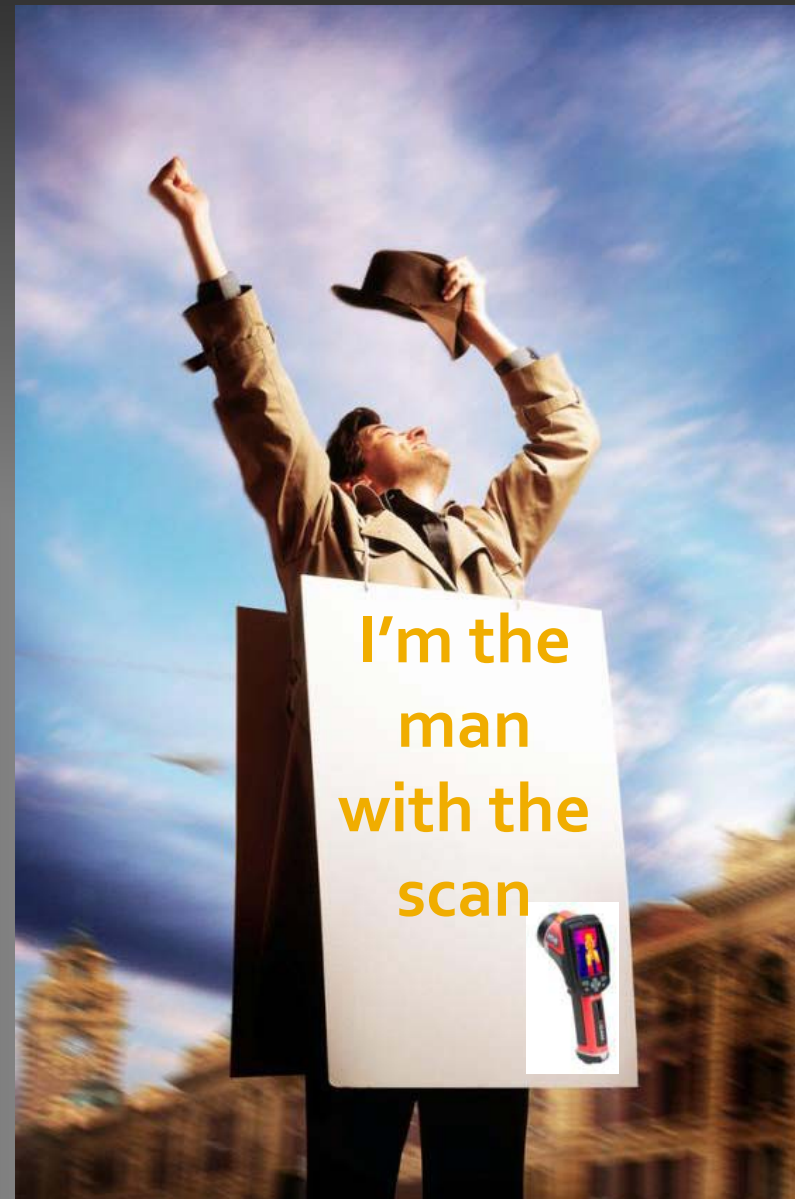
- Catchy phone numbers and matching web addresses
 - 1-888-SO-CAL-IR
 - www.socalinfrared.com



Marketing



- And just plain getting out there to tell the world what you can do!





Marketing

- But do not show up like this guy...



Marketing



- Submit stories to Newspapers and New stations



Marketing



- Many applications of infrared will allow you more opportunities
- Leak detection
- Roof Leak
- Electrical faults
- Medical applications
- Electronics
- Industrial
- And the list goes on.....Just Google it....



What to Charge for your services?



Video





Training

- Why is training important?
- Do I need to do it?

러닝머신
Running Machine

Video



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Introduction

The world's developing countries need more energy than ever and energy prices will continue to rise as we use up the fossil fuels. Because we have been subsidizing energy for many years and because of market forces, developing technologies to make and store energy and creating high-efficiency products has not been a priority of US business. As a result, technology is far behind and none of the alternative energy options are viable at this time. So, the perception is that we all need to reduce energy use to save money and prevent our enemies from becoming rich by selling us energy at an ever-increasing rate.





QUESTIONS & ANSWERS

1-888-SCAN-4-IR ext. 3

Peter Hopkins

peter@unitedinfrared.com



United Infrared, Inc.

www.unitedinfrared.com



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